

COMPUTERWORLD

\$2.00 A COPY; \$44/YEAR

DECEMBER 17, 1984

VOL. XVIII, NO. 51



Top position?
AEA chairman's view of U.S. electronics/15

Bumpy road ahead
Seagate Technology on a crowded highway/73



In Depth
Warnings about moving Cobol to micros Follows 60

IBM warns users of potential harm to head disk units

By Tom Henkel
CW Staff

RYE BROOK, N.Y. — IBM has notified the approximately 10,000 users of its 3380 disk drives that using certain types of air-conditioning system antibacterial agents can cause head disk assembly problems, including head crashes.

IBM said it has discovered that a small percentage of 3380 users developed head disk assembly problems in buildings that use organometallic biocides, principally those that incorporate tin oxide. The biocide is a chemical used in certain types of air-conditioning systems to prevent growth of bacteria in stagnant water. Scientists blame such bacteria for causing potentially fatal illnesses, such as Legionnaires' disease.

An IBM spokeswoman said less than 2% of 3380 customers have actually reported head disk assembly problems traceable to use of the chemical. IBM

See 3380 page 8

DP fight brews at GM

Transferred workers seek to keep benefits

By John Desmond
CW Staff

FLINT, Mich. — General Motors Corp. data processing employees are fighting on two fronts — in the courts and via a fund-raising effort — against the perceived loss of benefits resulting from their scheduled transfer to Electronic Data-Systems Corp. on Jan. 1.

A suit filed in U.S. District Court here Nov. 19 on behalf of two individuals alleges that the loss of certain retirement benefits by workers being transferred from GM to EDS is a violation of federal pension law. The suit was filed by attorney Jules Olsman of Southfield, Mich., on behalf of Thomas Omans and Gary Cattin of the GM Technical Center in Warren, Mich. The automaker acquired EDS for \$2.5 billion in a merger

approved by stockholders on Oct. 18.

Meanwhile, in an action that may eventually have broader repercussions, a corporation called Legal Fund to Restore Benefits, Inc. has been formed by several transferred GM employees to raise funds and bring focus to the legal efforts.

One GM systems analyst said that each worker is being asked to contribute \$100 until \$50,000

is raised, and the analyst said he is very confident that goal will be reached. More than 300 workers attended an LFTRB meeting here in late November, and meetings have since been held in Detroit and Lansing, Mich.

GM and EDS are both required to respond to Olsman's suit within 20 days after being served. Olsman said the

See EDS page 4

Hearings will begin next month on the attempts of some GM DP workers to join the United Auto Workers union. See page 4.

TOP OF THE NEWS

Five years' labor bears fruit. The Ansi X3J4 subcommittee has begun steps to pass its Cobol-80 standard. Page 2.

Flying high in anticipation. Airline industry data centers and other big users of millions of instructions per second machines are preparing for the expected 1985 arrival of IBM's Sierra series mainframes. Page 5.

Not as compatible as it was thought to be. That is the consensus of several early users of IBM's Personal Computer AT. They also found several faulty data sectors in the AT's hard disk. Page 6.

The debate over VDT safety intensified last week as two national labor groups launched an 18-state lobbying campaign for legislation on VDT-related

health issues. Page 8.

A large contingent of communications product vendors flooded Dexpo West '84, highlighting the growing industry demand for increased integration between Digital Equipment Corp. systems and those of other hardware vendors. Page 9.

The world is at his fingertips. A DP guru from the U.N. talks about life in a world of computerized global economic and social statistics. Page 10.

It'll be showdown time for IBM and NCR Comten, Inc. when they meet in court this month to battle over IBM's allegations that a consulting firm disclosed proprietary information. Page 73.

FYI

CAB prepares to ride off into 'sunset'

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — An independent agency of the U.S. government will actually go out of business Dec. 31. It will terminate, disappear or "sunset," as it is euphemistically called here. This unprecedented event is having some unprecedented effects on the agency's data processing office.

The independent regulatory agency headed for extinction is the Civil Aeronautics Board, a victim of U.S. Congress' 1978 decision to deregulate the airline industry.

When Congress passed the Airline De-

regulation Act of 1978, the reaction at the CAB's DP shop was a mixture of shock, disbelief and uncertainty. "It was an emotional roller coaster here for the last two or three years," according to Bradley H. Hoke, chief of the DP division for the past 10 years. "We didn't know if we were going to have a job from one day to the next."

Hoke, in a recent interview, said that after the legislation passed and the CAB's regulatory powers were whittled away, the DP budget was tightened, the aging hardware could not be replaced and the DP staff dwindled from a high of 47 to a low of 15.



CW photo by M. Betts
Hoke.

ferred to the U.S. Department of Transportation.

"It was pretty obvious [after passage
See CAB page 7

After years of unsettling rumors about the agency's fate, Congress settled the issue this year by approving the Civil Aeronautics Board Sunset Act, which states that the CAB will cease to exist Dec. 31, and most of its remaining regulatory functions will be transferred to the U.S. Department of Transportation.

CW 4810601VYVWU1VYM FCWE
UNIVERSITY MICROFILMS
SERIALS PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106

NEWSPAPER

NEWS

Cobol-80 nears final stages

Ansi committee close to completion of draft standard

By Paul Gillin
CW Staff

Drained by more than five years of continuous debate and facing increasing pressure from the international community, the American National Standards Institute (Ansi) X3J4 subcommittee, which is formulating the Cobol-80 standard, has begun its final steps to pass the draft standard into the last stages of acceptance.

If all goes smoothly, the draft could be sent to the parent Ansi X3 committee in April, X3J4 members said last week after the committee wrapped up its final meeting of the year. "We can see light at the end of the tunnel," said Jerome Garfunkel, president of Jerome Garfunkel Associates, Inc. in Litchfield, Conn., and a member of the X3J4 committee.

However, because of lengthy approval processes, a standard will not be approved until late 1985 at the earliest, they said. The document must still be approved by two other Ansi groups, either of which could call for more changes to the proposed standard.

But further changes are not likely to come from X3J4, members said. "The sentiment of the committee is to get on with it," said Lemuel Skidmore, vice-president of Online Systems Support, Inc. in Kensington, Conn., and vice-chairman of the X3J4 committee. "I think at the next meeting we will vote to pass the standard along to the [Ansi] X3 committee."

The X3J4 committee completed another round of public comment Nov. 14. At its most recent

meeting in La Jolla, Calif., in mid-December, the group drafted responses to the 23 comments that were received.

The committee will reconvene in February in Baltimore to consider the final responses. If no substantive opposition arises, it will vote to initiate a ballot for X3J4 members to vote on the proposed standard, Skidmore explained.

The X3J4 committee will then reconvene in April to tabulate the ballots and probably to submit the proposed standard to the parent Ansi X3 committee. The X3 committee will then be responsible for sending the proposal to the Board of Standards Review, the Ansi committee that decides whether or not to approve the standard.

Skidmore called late 1985 an optimistic date for implementation. He noted that changes could be called for at any stage of the approval process, delaying the standard further.

Garfunkel said action by the International Standards Organization (ISO) in February to adopt a draft international standard before approval by the X3J4 committee has contributed to the Ansi group's willingness to proceed.

The ISO standard is parallel to the "Pink Book," which is now under consideration within Ansi. If the Ansi standard can be implemented as it now stands, it would lead to identical standards at both the national and international levels.

"That is very much on the minds of the committee right now for selfish reasons," Garfunkel said. "IBM, [Honeywell, Inc.] and the rest don't want to have to support two separate compilers."

IBM's VS Cobol II not Cobol-80-based

IBM's VS Cobol II compiler, which is due to be available in the first quarter of 1985, should not be mistaken for a Cobol-80 compiler, members of the American National Standards Institute's (Ansi) X3J4 committee cautioned last week.

The upgraded compiler is based on the existing Cobol-74 standard and includes many extensions that were part of the original draft standard for Cobol-80. However, that 1½-year-old document, also called the "Blue Book," has been revamped and differs from the proposed "Pink Book" standard in several significant ways, according to Jerome Garfunkel, president of Jerome Garfunkel Associates, Inc. in Litchfield, Conn., and a member of the Ansi X3J4 committee.

For example, the EVALUATE verb in VS Cobol II does not include an ALSO verb, which is included in the latest version of the standard. "If users start using this new feature, they will still have

to make a miniconversion when the Cobol-80 standard is approved," Garfunkel said.

Lemuel Skidmore, vice-president of Online Systems Support, Inc. in Kensington, Conn., and vice-chairman of the X3J4 committee, noted that IBM may end up supporting three different compilers for the same language.

The company has committed itself to supporting existing VS Cobol compilers for three years while introducing a new compiler and planning to bring out a Cobol-80 version when the standard is finalized. Skidmore said customers should discuss the matter with IBM to ensure that a consistent upgrade path is provided.

Garfunkel cautiously advised users to upgrade to VS Cobol II to take advantage of the extensions. But he warned that some kind of conversion will probably be necessary when a Cobol-80 compiler becomes available.

Ronald A. Frank, 1934-1984

MONT VERNON, N.H. — Ronald A. Frank, managing director of the Frank Communications Group and a former *Computerworld* editor, died last week after an extended illness. He was 50 years old.

A graduate of Fairleigh Dickinson University in Teaneck, N.J., Frank joined *Computerworld* in July 1969 as a technical news editor. He left the newspaper as a senior editor/communications in September 1979.

Long-time acquaintance William Leitch, general manager of the Communications Networks national telecommunications conference, said Frank, a regular speaker at the conference, will be missed. "We were always surprised at what superb ideas came out of such a small package," Leitch said.

Molly Upton, a fellow editor during Frank's ten-

ure at *Computerworld* and currently director of publications at International Data Corp., remembered him as a man "who kept a lot of us honest." Frank, according to Upton, was a man with "very high standards."

Before joining *Computerworld*, Frank had worked at Bendix Corp. and as a technical writer at Honeywell, Inc.

A member of the Institute of Electrical and Electronics Engineers, Inc., he held an MBA degree from Babson College, Wellesley, Mass., and had been pursuing a Ph.D. at Boston University.

He is survived by his wife and two children.

Memorial contributions can be made to a scholarship fund being established by another of Frank's fellow ex-*Computerworld* editors, Vic Farmer. Farmer resides at 14 Catherine St., Newport, R.I. 02840.



Frank

NEWS SUMMARY

The National Labor Relations Board will consider the bid by a group of transferred General Motors Corp. DP workers to join the United Auto Workers/4

The airline industry, among others, is anticipating the arrival of IBM's Sierra high-end mainframe series/5

Early users of IBM's Personal Computer AT are encountering compatibility problems/6

Two national labor groups have launched an 18-state lobbying campaign for legislation on VDT safety/8

The recent Dexpo West '84 show accentuated the growing demand for integration between Digital Equipment Corp. systems and those of other vendors/9

The assistant director of the United Nations' computing services has a world's worth of information on an IBM/10

The U.N.'s Carole Thompson was an office automation manager before the term existed/11

General Electric Information Services Co. is repositioning itself as a telecommunications carrier/12

Several computer performance analysts at a recent conference discussed computing needs and concerns/13

CW interviews William Moore, the newly named chairman of the American Electronics Association/15

Satellite Network Delivery Corp. joined satellite and teletext into a network delivery service/16

The Canadian Computer Dealers Association contends that 90% of the software programs used in Canada are illegal/18

Thirty Fortune 500 firms are funding a program to train handicapped workers as computer programmers/24

Students protesting at Ohio's Oberlin College failed to bring down the campus computer system/27

IN DEPTH

Moving Cobol to micros/ Follows 60
Computer crime/ ID/11

Washington Update/14
International Report/22
Off the Press/30
Calendar/34

EDITORIAL/38

SOFTWARE & SERVICES/41
COMMUNICATIONS/53
SYSTEMS & PERIPHERALS/57
MICROCOMPUTERS/61
COMPUTER INDUSTRY/73

What's the news?

Hard as we try to give our readers the most complete information available, some good news and feature stories never reach us.

Are you involved in an unusual application of DP technology in your company? Have you implemented successful cost-cutting strategies? Is something in your DP shop not working as designed? Know any unsung heroes? Heard any hot news about vendors? Are you aware of technology or management trends the trade press is overlooking?

If so, we'd like to hear from you. *Computerworld* has established a reader hot line for information regarding items of interest to the computing community. Call us toll free at (800) 343-6474. Ask for Donovan White, assistant managing editor.

We can't be everywhere — but our readers are.

HEADACHE

How do you spell relief from the pain of Documentation? (S-Y-D-O-C.)

Call (201) 568-9700.

Cut your COBOL
Maintenance
costs.

SYDOC:
STRUCTURED
DOCUMENTATION
SYSTEM FOR OS/VS

syncsort
INC.

Syncsort Incorporated 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

QUESTION: Which is a bigger headache? The COBOL-documentation problem or the high-cost-of-maintenance problem?

ANSWER: Both.

* * *

We're not kidding. Documentation and high maintenance costs are both parts of the same big headache. Here's why:

1. THE PROBLEM BEGINS WITH DOCUMENTATION: And it begins right at the program-development stage.

Most programmers hate to document. And although they may think they are producing well organized programs, they really have no way of judging. If they produce badly organized programs, they will inevitably produce badly organized documentation, too. One always equals the other.

2. BAD DOCUMENTATION LEADS TO COSTLY MAINTENANCE: Even if the documentation started out being accurate, it's probably never been updated. When modifications occur, someone's got to go back and attempt to divine the underlying logic before new code can be inserted. A long and costly operation.

No wonder COBOL maintenance may consume as much as 75% of your entire budget!

FAST RELIEF WITH SYDOC: Our Structured Documentation System takes the documentation problem off the shoulders of your programmers and puts it where it belongs—on the computer:

• **SYDOC HELPS YOU DEVELOP STRUCTURED PROGRAMS.** It not only provides structured documentation, it is also a very useful guide for the production of structured COBOL programs. Flaws and inconsistencies can be spotted at the development stage. And corrected before they start driving your maintenance costs up.

As a manager, you will—for the first time—have a tool to standardize both your documentation and the quality of your programs.

• **SYDOC MAKES IT EASY TO MODIFY EXISTING PROGRAMS.** It can analyze "orphan" programs without adequate documentation and tell you everything you need to know about the program's structure, logic, variables and relationships. Armed with this knowledge, the maintenance problem shrinks.

No longer is it necessary for skilled programmers to spend days searching for clues about the program's logic. SYDOC makes all necessary information available quickly and easily.

But the best way to find out about SYDOC is to try it. If this remedy doesn't work you'll just have to try another—A-S-P-I-R-I-N.

NEWS

NLRB to review GM DP workers' unionization efforts

Hearings planned for next month; elections granting UAW representation may follow

By John Gallant
and John Desmond
CW Staff

DETROIT — Hearings before the National Labor Relations Board (NLRB) are scheduled to begin next month on the attempts by some soon-to-be-transferred General Motors Corp. DP workers to win representation by the United Auto Workers union (UAW).

The NLRB told *Computerworld* last week that preliminary hearings will be held Jan. 7 to review four petitions the UAW submitted in late November on behalf of salaried GM DP employees seeking to become members of the union. The petitions were signed by workers at four GM facilities who were concerned about the perceived loss of benefits involved in the transfer of GM's DP and communications employees to the payroll of Electronic Data Systems Corp. (EDS) [CW, Nov. 12].

Following the hearings, the NLRB may approve elections for workers at four GM units — the Fisher Body facility at the GM Technical Center in Warren, Mich.; a unit at the GM assembly facility in Willow Run, Mich.; and the GM Photographic Division and the GM Information Systems and Communications Activities unit at GM headquarters in Detroit.

EDS from page 1

deadline will be reached this week.

Asked to comment on Olmsman's suit, EDS Senior Vice-President Ken Riedlinger said, "It has no merits, and I think you will find that we will win. There are preliminary legal — I hate to use the word maneuverings — actions being taken in response to that suit. We are investigating their allegations." GM spokesman William Winters had no comment on the suit. He confirmed that the EDS retirement package does not include early retirement after 30 years of service, as does GM's package.

Attorney Donald Gasiorek of Somers, Schwartz, Silver and Schwartz, P.C. of Southfield, who said he was asked to get involved with LFTRB by some GM employees, said taking on GM would be "an expensive proposition."

"Their intent is to retain the benefits they had at GM," Gasiorek said of the LFTRB backers. "The question is how good is it for EDS to suddenly wind up with 10,000 disgruntled employees. You don't want people so distraught it has an impact on productivity," he added.

Neither GM nor EDS spokesmen had any reaction to the fund-raising activities. GM spokesman Winters said he was aware of the fund and added, "All I know is what I read in the paper." A spokeswoman for EDS said last Wednesday the company was not aware of the LFTRB fund.

Both lawyers said the actions are unusual, because when the larger company — GM — acquired the smaller company — EDS — the employees of the larger company were apparently given the same benefits as the employees of the smaller company.

"Usually, a smaller subsidiary becomes part of the larger whole. Here,

'We will vigorously oppose any effort to form a union in EDS. We feel strongly against the unionization drive because there is no need for it. There is no place for it within EDS. I am confident that no union is going to be formed.'

Ken Riedlinger, senior vice-president, EDS

A UAW spokesman was quoted in local press reports as saying that the petitions seek UAW representation for 324 workers at those units, although the union would not confirm that figure. If elections are held, a simple majority vote by workers in the proposed bargaining units would make the employees members of the UAW. GM currently employs some 7,000 DP workers at more than 115 locations within the U.S. and another 3,000 at facilities outside the country. On Jan. 1, the automaker's U.S. DP staff is scheduled to be transferred to EDS, which was acquired by GM for \$2.5 billion in mid-October.

According to a UAW spokesman, the drive for union representation began in early November after several GM DP workers approached the UAW following EDS' unveiling of its salary and benefits package. The

spokesman said the union then began holding informational meetings — which sources within the automaker's DP operations said were attended by several hundred employees — and later sponsored petition drives within GM facilities.

Although the UAW declined to discuss the number of facilities involved in the petition drive, a union spokesman was quoted earlier as saying that, in addition to the four named units, the UAW was attempting to organize 25 other U.S. locations where GM DP workers are employed.

Several sources within GM's DP operations, who asked not to be named, said the unionization efforts were spawned by fears of a reduction in benefits following the transfer of workers to Dallas-based EDS. In addition to the UAW petition drive, employee concerns have manifested themselves in proposed legal action against GM and its newly won subsidiary (see story page 1).

The sources said workers were upset over the loss of annual cost-of-living allowances and overtime pay, changes in the structure of retirement plans and reductions in dental, vision and dependent health care benefits. EDS maintained that the transferred workers would be compensated for benefits changes with what the company described as a generous stock giveaway plan [CW, Nov. 12] and merit raises larger than those generally awarded by GM.

NLRB regulations require that at least 30% of the employees in a proposed bargaining unit sign the petition seeking elections for union representation. Although the UAW would not specify the percentage of GM workers involved in the petition drive, a union spokesman confirmed an earlier statement that more than 60% of the workers in the four units

had signed.

"We are pleased with the progress of the campaign," the UAW spokesman said. "There will probably be separate elections for each petitioning unit. How many workers eventually come into the union depends on how many elections are held and how many of those elections are successful. If any of the units vote to join the union, we intend to arrange bargaining [with EDS] right away."

According to Henry Chiles, assistant to the regional director for Region Seven of the NLRB, the preliminary hearings will focus on the structure of the proposed bargaining units. Discussions will likely involve the job titles to be included in the units and the size of the employee groups for which elections could be held.

"The NLRB really controls the time period for the elections. It can be as short as a few weeks, or it could be months," the UAW said.

'UAW effort to increase rolls'

According to Ken Riedlinger, senior vice-president with EDS, only a very small percentage of GM employees actually want union representation. "I think it is the UAW trying to get the salaried workers to unionize, rather than the other way around," he said. "The thing you need to understand is that this is really not a GM/EDS issue; this is an effort by the UAW to increase its rolls. It really has very little to do with the merger."

"EDS is certainly opposed to any union occurring within EDS, and we will vigorously oppose any effort to form a union in EDS," Riedlinger said. "We feel strongly against the unionization drive because there is no need for it. There is no place for it within EDS, and I am very confident that no union is going to be formed."

One GM DP worker, a former UAW member, said he would not support the union's efforts. "The union takes everybody to the middle," he said. "If you are a highly motivated, success-oriented employee and the guy sitting next to you just wants to collect a paycheck and be comfortable, you are both going to get the same pay. I am not interested in being in the middle. I am interested in being on top."

Second-class postage paid at Framingham, Mass., and additional mailing offices.

Computerworld (ISSN 0010-4841) is published weekly, except: January (6 issues), February (6 issues), March (5 issues), April (7 issues), May (7 issues), June (6 issues), July (6 issues), August (6 issues), September (7 issues), October (7 issues), November (6 issues), December (5 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/Inc., 375 Cochituate Road, Box 880, Framingham, Mass. 01701.

Copyright 1984 by CW Communications/Inc. All rights reserved.

Computerworld can be purchased on 35 mm microform through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed: write to Copyright Dept. for subscription information.

PHOTOCOPY RIGHTS: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Communications/Inc. for libraries and other users; registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970.

Permission to photocopy does not extend to contributed articles followed by this symbol: ☐

Special requests should be addressed to Nancy M. Shannon, CW Communications/Inc., 375 Cochituate Road, Box 880, Framingham, Mass. 01701. ISSN 0010-4841/84 \$3.00 + \$.50. \$2.00 a copy: U.S. — \$44 a year; Canada, Central & So. America — \$110 a year; Europe — \$165 a year; all other countries — \$245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.



POSTMASTER: Send Form 3579 (Change of Address) to *Computerworld*, Circulation Department, 375 Cochituate Road, Box 880, Framingham, Mass. 01701.

NEWS

Airlines ready DP centers in anticipation of Sierra

By John Desmond
CW Staff

TARPON SPRINGS, Fla. — The Sierra series of mainframes has not yet been announced by IBM, but users with bulging processing demands are nevertheless preparing their data centers for an anticipated 1985 arrival of the high-end IBM series.

Analysts project that the initial Sierra will offer at least 29 millions of instructions per second (Mips) processing power at a price more favorable than 3080 series mainframes.

The heavy Mips-using data centers at commercial airlines, which process on-line reservation systems, are especially anxious for Sierra's arrival. According to Gerald Doherty, director of computer operations at Trans World Airlines, Inc. (TWA), "The demands are such that we will need another large uniprocessor in an early-1986 time frame."

Doherty said TWA's data center currently uses a 3033 CPU in tandem with high-performance version 3083 CPUs. "To help us bridge from our current capacity through 1985, we've implemented a support processor using an IBM 3033 in a form of multiprocessing," Doherty said. In a method transparent to users, the 3033 is used to answer all inquiries on seat availability, while the 3083s perform the reservation function. "The 3033 is thought of as a helper processor," Lewis said.

If the Sierra is delayed beyond its expected spring announcement, Doherty said, "other individual packages can be off-loaded based on need. But you do reach a practical limit for that concept to work. If Sierra is not announced in early 1985, we'll have to move additional loads to helper processors." Another possibility is to upgrade the helper 3033s to 3083s, he said.

Anticipated MVS/XA-only support

United Airlines, Inc. is converting its mainframes to the MVS/XA operating system in preparation for Sierra, which is expected to support only extended architecture, according to James Peyton, systems engineer with United's Chicago data center.

In its three data centers, United runs 9083s and 9081s, which are 3083 Model JX and 3081 Model KX specially modified by IBM for the airline industry. If Sierra is announced in the spring, United plans to replace its 9081s with Sierras, Peyton said. If Sierra is delayed beyond the summer, when United will need more processing power, the company will either go to a 3084 configuration or buy another processor, neither of which is as attractive an option, Peyton said.

To move from a 9081 to a 3084 Model QX, United would have to spend approximately \$500,000 to make the 9081 look like a 3081, and in the process "enhanced Thermal Conduction Modules would have to be yanked out and more standard products installed," Peyton said. United would then have to upgrade the 3081 to a 3084, he said. "That is not financially attractive to us, because there is no migration path from a 9081 to a 9084; there's no such box," Peyton said.

Projections that Sierra would offer more processing power in the same or less floor space are also attractive to United, which has limited floor space

in its data centers.

Dalton Wiley, American Airlines, Inc.'s manager of capacity planning, said, "We want Sierra now. We need more capacity." American is running its reservation system on four 9083s running the Airline Control Program (ACP). Since ACP would not run on an extended-architecture-only machine, American is now investigating what code changes would be needed to allow the software to run in extended architecture mode, Wiley said.

Wiley also said it is difficult for him to plan because the product's details are so uncertain. "What we're really after is some information as to whether it will be [extended-archi-

tecture-only]," he said. "We need some [specifications] so we can do some planning." He said American will consider entering IBM's Early Ship Program when the product is announced "if that's what it takes to get it early."

American has a backup plan should Sierra be announced later than expected. "Our contingency is to run more than four machines simultaneously," Wiley said. Changes by American's own programmers will allow up to eight CPUs to run ACP concurrently to gain needed capacity, he said. But the fallback position has the drawbacks of "investment in today's technology when tomorrow's is right around the corner," as well as

the added complexity of more multiprocessors plus added personnel and operations costs, Wiley said.

Airlines are not the only users planning for Sierra. When the long-term 3033 mainframe lease of Martin Marietta Data Systems, Inc. in Orlando, Fla., runs out in 1985, the company plans to obtain a month-to-month lease in order to bring in Sierra sooner, according to E. Britt Crawford, manager of performance and tuning. His shop runs a total of six 3033 and 3084 mainframes. "We feel the Sierra will be available in June," he said, but if the product is delayed beyond July or August, "we'll have to decide on another 3080 series" mainframe, he noted.

SYSOUT Management Made Easy With \$AVRS

UNTIL NOW there has not been an integrated approach to the management and archival of SYSOUT and SYSLOG. \$AVRS, from Software Engineering of America, solves this problem by completely automating the management and storage of this critical JES output.

\$AVRS features and benefits:

- ☑ savings in printer and paper costs
- ☑ savings in personnel costs
- ☑ comprehensive production and test JCL error checking
- ☑ immediate access to JCL of failing jobs through any terminal
- ☑ complete ISPF-like interactive and batch retrieval facilities
- ☑ ability to produce statistical analysis of SYSOUT using \$AVRS commands
- ☑ archival and retrieval of SYSOUT by class, name, time, etc.
- ☑ increased data center security

\$AVRS is saving thousands of dollars daily at over 200 data centers by providing efficient and cost effective management and archival of SYSOUT and SYSLOG.

To obtain further information on how \$AVRS can benefit your installation, call
SOFTWARE ENGINEERING OF AMERICA at [212] 206-7660
150 Fifth Avenue, New York, NY 10011.

SOFTWARE ENGINEERING OF AMERICA

SEA

NEWS

IBM AT falls short in Personal Computer compatibility

By Edward Warner
CW Staff

Early corporate users of the IBM Personal Computer AT say the unit is not as IBM Personal Computer-compatible as they had expected and that its optional 20M-byte hard-disk storage unit has faulty data sectors. But on the whole, they are happy with the machine, and some are even planning to buy it instead of the IBM Personal Computer XT.

Introduced in August, the Personal Computer AT features an Intel Corp. 80286 microprocessor that is nearly twice as fast as the Intel 8088 in the Personal Computer. It also offers from 256K to 3M bytes of random-access memory (RAM), a choice of 1.2M- or 360K-byte diskette drives, 20M-byte hard-disk storage and a somewhat redesigned keyboard.

The users, few of whom had worked with the AT for more than a month, said they like the AT's speed and storage capacity and would put it to use for work with spreadsheets and data base management systems (see story page 7). They tempered their praise with some criticism, however.

Software incompatibility

Most complaints centered on compatibility with the software, storage peripherals and add-on boards designed for the Personal Computer. Several users also voiced unhappiness with the inability of the AT's

1.2M-byte diskette drives to write in a format that can be read by the 360K-byte drives of the Personal Computer.

According to Richard Strauss, vice-president for products at Corporate Software, Inc. in Waltham, Mass., only about 35% of the Personal Computer's software base has been certified as usable on the new machine. He indicated that most popular applications packages will run, but Max Hughes, vice-president of systems and computing at the pharmaceuticals division of New York-based Pfizer, Inc., said he is unable to use Ashton-Tate's Framework integrated package. A version of Framework has since been announced for the AT.

Compatibility problems have also arisen when some users tried to insert communications add-on boards for the Personal Computer into one of the eight expansion slots of the AT. Roy Hill, chief programmer in the technical support section of Michigan Blue Cross/Blue Shield, said he found the Hayes Microcomputer Products, Inc. Smartmodem board would not work in any of his firm's four ATs.

Bad disk sectors

For users with the 20M-byte internal hard disk, the most common complaints involved disk sectors. Bob Lane, microsystems consultant for Merrill Lynch Pierce Fenner & Smith in New York, said one 20M-byte storage unit has 40K bytes worth of bad

sectors with which his office is stuck until the disk's data can be backed up and the disk reformatted.

An IBM spokesman, meanwhile, admitted that 20M-byte storage units had been shipped with as many as 10 faulty sectors but added that the units were still in line with IBM's requirement of a minimum capacity of 21.8M bytes of usable storage. "We do not ship drives that fall out of an acceptable range of quality," he said.

Other problems cited by users included the following:

- Inability to access full potential RAM. The current lack of access, under IBM's PC-DOS operating system, to the AT's full potential for 3M bytes of RAM, led Moore McCormack Resources, Inc. to put off an AT purchase, at least for now, according to its controller, Andrew Langlois.

- Backup system needs. One user criticized what he called IBM's failure to offer a backup storage system for the AT, while another said the AT is not compatible with the popular Iomega Corp. Bernoulli Box storage system for the Personal Computer.

- Keyboard only slightly changed. Several users said IBM has yet to incorporate what they see as needed changes to the Personal Computer keyboard. Instead, they said, changes found in the AT keyboard are small but are still significant enough to confuse users.

- Screen update speed. Though the AT recalculates data quickly, one user said it is somewhat slow in updating screens of information.

Another corporate user pointed out that the AT can be upgraded from 512K bytes to its full 640K-byte RAM capacity only by addition of a 128K-byte memory add-on board available only from IBM.

Some users have no problems

On the positive side, problems with the 20M-byte hard-disk unit are not being reported by all users. Five corporate micro specialists said they had experienced no problems with

their AT's hard disk, but one of them, Hank Kee, vice-president for personal computing at New York's Chemical Bank, said he encountered other issues with the machine.

Kee said that among those issues was what he termed the lack of a viable backup system from IBM. Streaming tape drives are available from third-party vendors, he noted, but users must otherwise establish backup using a series of diskettes.

Another corporate user knocked the machine's lack of a detachable keypad, something he said would be especially useful for entering data to a spreadsheet. He said his firm's AT users find the AT's keypad so debilitating that they usually use the numbers at the top of the keyboard for numerical entries.

Why are users having problems with the much heralded machine? According to micro industry analyst Aaron Goldberg of Framingham, Mass.-based International Data Corp., IBM is "letting the power users [of the AT] shake it down fully" while making a profit on AT sales.

Power users most tolerant

The power users, Goldberg claimed, "will be the most tolerant of faults" and will put the machine to its toughest tests.

Dan Spinner, chief operating officer of Management Information Software, Inc. in New York, said problems with the 20M-byte hard disk were arising because IBM is "pumping them out much faster than they can get good quality control." An IBM spokesman responded to Spinner's claim by saying the drives are tested throughout their manufacturing process.

Though some users are enamored enough of the Personal Computer AT to see it as the eventual standard for their firms, others are not promoting the machine until they satisfy their concerns about users' needs, the Personal Computer AT's compatibility and its hard-disk quality problems.

Scribe® puts math in your documents

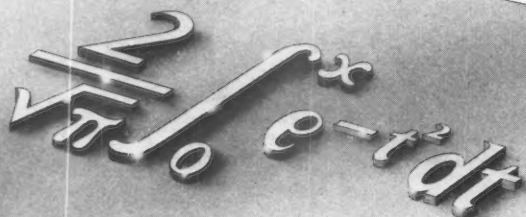
Why cut and paste to insert mathematical equations and symbols in your documents? The Scribe Document Production System software intermixes text, graphics, special characters, and mathematical equations in all types of printed output. Output such as manuals, proposals, textbooks, and technical publications. Scribe lets you include complex mathematical expressions that look professionally typeset. And wait till you see how easy it is.

Scribe is available for DEC, Prime, IBM, Sun, Apollo, and most UNIX systems. Your output can be printed on a spectrum of devices from letter-quality typewriters to photocomposers and laser printers.

Scribe makes producing mathematical output as easy as π . To get started contact Wayne McDaniel.

UNILOGIC, Ltd.
160 North Craig Street
Pittsburgh, PA 15213
412-621-2277

UNILOGIC



Scribe is a registered trademark of UNILOGIC, Ltd.

The wait is the drawback

The greatest problem for users of the IBM Personal Computer AT may not be software incompatibility with the IBM Personal Computer, hard-disk data losses or getting used to a somewhat rearranged keyboard.

It could be the wait.

The Commercial Banking Group of San Francisco's Wells Fargo Bank, N.A. was among the first to order Personal Computer ATs, purchasing three units shortly after the machine was introduced Aug. 20, according to the group's senior systems analyst, Kingsley Mar. Mar said he is now "pacing the loading dock. They are due any day now."

The Budd Co., a Madison Heights, Mich., automotive parts manufacturer, also was an early buyer of the Personal Computer AT but does not expect to receive its first unit until early next year, reported Larry Hamilton, management information services director.

Overall, "availability is a pain,"

according to Rich Reed, microcomputer manager with Cigna Corp. of Bloomfield, Conn., which has 10 to 20 ATs on order. Reed, who placed his order about a month ago, said his supplier has told him that orders being placed now will not be filled until March.

All that should change, however, according to data compiled by International Data Corp. (IDC), a Framingham, Mass., research firm. Though AT shipments in 1984 will total only 25,000, IBM will ship as many as 300,000 ATs by the end of next year, according to IDC analyst Steve Bosley.

Ironically, the demand for new machines may have limited the supply of demonstration models as well, according to Cigna's Reed. Reed said the AT loaned to his office by an IBM sales representative had seen so much intensive duty at other demo sites that, when it arrived at Cigna, "it looked like it had been dumped off a truck."

NEWS

CAB from page 1

of the Sunset Act) that deregulation was a fact and was not going to be turned around," he said.

For Hoke, this was an important step because it meant he could begin planning for the transfer of the DP division's personnel, hardware, soft-

ware and magnetic tapes to the DOT computer center. "The fate of the [Civil Aeronautics Board] had to be decided first, before we could get into that [planning] detail," he said.

During the last six to nine months, Hoke and DOT officials have worked out details on how to transfer hardware, maintenance contracts, personnel, software, data services and magnetic tapes. The applications programs and data files will not be changed by the transfer, so no new user training will be needed, Hoke pointed out.

"Our basic objective has been to make the transition without any serious degradation of support services," Hoke said. "We're in excellent shape right now" for the transfer on Jan. 2-3, he said.

Although most of the CAB's peripherals will be transferred directly

to the Transportation Computer Center, Hoke said DOT officials insisted on replacing the CAB's mainframe with an IBM 4381. The old CAB mainframe, installed in 1975, is an IBM 370/155 Model II, which Hoke explained is an IBM 370/155 fitted with a dynamic address translation facility to make the CPU equivalent in throughput to an IBM 370/158.

By replacing the old CPU at the same time as the transfer, Hoke said, "I guess you could say we're killing two birds with one stone."

At DOT, the receiving end of this transfer, absorbing the CAB hardware will go smoothly because the modern Transportation Computer Center had the space, power and air-conditioning available to handle the additional equipment, according to Don Southern, special projects officer.

But Southern said the installation of about 50 terminals and a communications network for the new users has been a headache. He said that high-level managers were slow to decide which users would be performing particular functions and in what offices. Until recent meetings resolved those details, it was difficult to plan how many remote cluster controllers were needed or how to run coaxial cables from the computer room to the offices, he said.

Hoke will join DOT's Office of Information Systems and Telecommunications Policy, while his staff will move to the Research and Special Programs Administration. "If we felt like boat people, this would be a terribly traumatic experience. But the reception we've had has been one of respect — very positive — and we're grateful for that," Hoke said.

AT over XT?

By Edward Warner
CW Staff

Corporate users of the IBM Personal Computer AT contacted by *Computerworld* said the machine's speed — roughly twice that of its predecessor — and its optional 20M-byte storage capacity outweigh its compatibility problems with the software and peripherals of the IBM Personal Computer.

Most said they will pass up purchasing the Personal Computer XT in favor of the AT — priced only several hundred dollars more — and several even said they expect to make the AT the cornerstone of their office's personal computing.

The majority of microcomputer managers, a dozen of whom were interviewed over the past week, said their firms bought the AT in its enhanced version, with 512K bytes of random-access memory (RAM), a 20M-byte hard-disk storage unit and 1.2M-byte and 360K-byte diskette drives. The machines, they said, would be used by their firms' experienced personal computer users in working with spreadsheets and data base management systems.

Several wondered how extensive the use of the ATs would become. "I'm not all that sure we need as much power as the AT represents," said Larry Hamilton, management information services director of the Budd Co., a Madison Heights, Mich., auto parts manufacturer.

Others, though, were not so uncertain about their firms' need for personal computing power. "The main aspect is the speed," said Tom Thibault, vice-president of the Real Estate Industries Group of Wells Fargo Bank N.A. in San Francisco. Thibault said he favored the AT's speed because, "I can get hard-disk storage [in] a variety of ways."

That speed increase might make for as much as a 10% to 20% boost in productivity among those working with large spreadsheets or data bases, estimated Robert Wasserman, a consultant in the management consulting division of Peat, Marwick, Mitchell & Co.'s Minneapolis office. Wasserman said the arrival of the firm's new Personal Computer AT was timely because his office was bumping up against a need for greater memory capacity among the other 15 to 20 Personal Computers already in use there.

In Wells Fargo's Commercial Banking Group, senior systems analyst Kingsley Mar said the organization "hopes to make the AT the cornerstone of all of our offices." The group's first three ATs are on order, each with 640K bytes of RAM, 1.2M- and 360K-byte diskette drives but no 20M-byte hard disk. Mar said the group would rather buy its own 60M- or 80M-byte hard-disk units from third-party vendors.



**Only INNOVATION (not even IBM)
supports a STAND ALONE BACKUP program
or provides a STAND ALONE program
that supports XA mode**

**WHEN DISASTER STRIKES while
your processor is running in XA
mode or 370 mode...**

- SAR automatically determines running mode (XA or 370)
- XA mode support saves critical time in a disaster/recovery mode
- XA mode support makes operator procedure simpler and less error-prone
- XA mode support eliminates the need to maintain an alternate IOCDs to use in 370 mode for SAR

**INNOVATION's SAR provides the
fastest RECOVERY.**

SAR supports dumping of disk volumes, data sets, or tracks when no operating system is available.

STAND ALONE BACKUPS Since you can use the DUMP feature of SAR to backup the volume before the restore, STAND ALONE BACKUPS eliminate the need to keep a spare volume to do restores in case the system pack goes down.

VM USERS SAR backup and restore functions are supported under VM.

//////FDR — The Fastest DASD Management System...

**For Your Free
No Obligation 90 Day Trial**

CALL (201) 777-1940, or write:

**INNOVATION
DATA PROCESSING**
970 Clifton Ave., Clifton, NJ 07013

NEWS

STC, others eye tin oxide

By Tom Henkel
CW Staff

While IBM appears concerned that organometallic biocides can cause damage to some of its disk drives, makers of competing products using the same basic technology do not appear to be as worried.

IBM-compatible disk drives manufactured by Memorex Corp. and Storage Technology Corp. (STC) use the same flow-through technology which draws air through the drive's head disk assembly for cooling. But neither firm has been able to identify head disk assembly failures caused by tin oxide contamination. Spokesmen for both Memorex and STC, however, admitted that their drives have been in the field roughly half as long as many IBM 3380s. The spokesmen both said IBM's 3380 head disk assembly problems developed after the units had been operating for about a year. The bulk of STC and Memorex 3380-compatible drives has been installed in the past four to six months.

Randy Watson, STC's disk product manager, said his company is also recommending that users discontinue use of organometallic biocides in computer rooms. But Watson said there only appears to be a potential for damage to head disk assemblies when tin-oxide-based biocides are introduced into air-conditioning systems in large quanti-

ties. Watson contended that if the chemical is used in the quantities recommended by chemical manufacturers, the environment should be safe for disk drives.

STC originally decided to recommend that the use of organometallic biocides be restricted to chemical manufacturers' recommended levels. But since chemical manufacturers' recommended levels for the biocide appear to differ, STC decided to alter its position. STC researchers have discovered that many air conditioner maintenance personnel consistently misuse organometallic biocides. Watson explained that organometallic biocides are typically introduced into water flowing through an air-conditioning system at rates greater than the recommended dose of roughly five drops per 1,000 gallons of water.

Memorex has not yet determined whether organometallic biocides are having an adverse effect on its 3680 drives. Memorex has not discovered any 3680 head disk assembly problems directly attributable to tin oxide contamination. The three other makers of 3380-compatible disk drives, Control Data Corp., National Advanced Systems, Inc. and Amdahl Corp., each said their 3380-compatible drives use a sealed head disk assembly unit and therefore appear to avoid tin oxide contamination problems.

3380 from page 1

is recommending that all users of 3380, 3370 and 3375 disk drives discontinue use of the organometallic biocides. The spokeswoman added that, so far, only 3380 users have actually reported head disk assembly problems, and only they have been formally notified of the potential problems. International Data Corp., a Framingham, Mass., market research firm, estimated that IBM has installed roughly 90,000 3380s at approximately 10,000 user sites.

The IBM spokeswoman added that a notice, which has already been added to IBM technical documents, includes the 3370 and 3375 disk drives as a precaution. She said no head disk assembly problems have been reported on the 3370s and 3375s.

While IBM is not recommending that users stop using biocides, it is recommending that use of organometallic biocides be discontinued. Other biocides apparently do not have an effect on the IBM disk drives. A spokeswoman emphasized that while the organometallic biocides can cause problems in IBM equipment, there is no apparent health risk to workers in buildings where the chemicals are used.

The potential problem stems from the basic design of 3380, 3370 and 3375 head disk assemblies. These units draw air from the computer room to equalize pressure and cool the head disk assembly. While the air passes through a three-stage filter that can eliminate particulate matter down to the submicron level, the biocides enter the head disk assembly in a gaseous form.

Ford Motor Co. in Dearborn, Mich., has experienced 3380 head disk assembly problems, which IBM attributed to tin oxide contamination. A Ford executive, who asked not to be identified, called the contamination a nuisance that took several months to resolve. "It wasn't like all the 3380s were going down at once," he said, noting that only a small number of

the firm's 3380s actually developed head disk assembly problems.

IBM recommended that Ford stop using the organometallic biocide and clean the tin oxide residue out of the computer room. Ford complied but still experienced intermittent head disk assembly failures, although the frequency of the failures appeared to decline. The failures continued to diminish with time, the executive said, noting that about three months after discontinuing use of the organometallic biocide, "the problem appears to be behind us."

Other large users of IBM disk drives whose air-conditioning units used the organometallic biocide also admitted experiencing a higher than normal incidence of head disk assembly problems when contacted last week. But they could not say whether the problems were attributable to the organometallic biocide used in their shops.

The IBM spokeswoman declined to explain exactly what potential problems the organometallic chemicals can cause, but she said 3380s that have developed head disk assembly problems attributable to tin oxide contamination have been replaced without charge. Some industry observers contend the buildup of tin oxide on read/write heads and disk platters can cause head crashes. Others, however, contend tin oxide contamination can cause other mechanical problems within the head disk assembly, such as short circuits in read/write head and actuator arms and damage to the disk media.

Bob Arnold, a technician with Empire Engineering, Inc., a Quincy, Mass., air-conditioning contractor specializing in computer room systems, noted his firm does not recommend the use of organometallic biocides because they have been known to cause mechanical problems with other types of machinery, such as the machinery used in air-conditioning systems. Arnold added that relatively few buildings use air-conditioning systems that require the biocides.

Groups to push VDT bills

WASHINGTON, D.C. — Two national labor groups last week launched an 18-state lobbying campaign for legislation on VDT safety. The Service Employees International Union (SEIU) and 9 to 5, the National Association of Working Women, plan to use their "collective clout" to push for VDT legislation in each of the 18 states targeted, according to Elaine Taber, program director at 9 to 5.

Karen Nussbaum, president of District 925 of the SEIU in Cleveland and a 9 to 5 director, said the "Campaign for VDT Safety" will consist of a traditional effort to lobby for the legislation. Letter-writing campaigns, educational programs and discussions with legislators are planned in each state.

Discussions will focus on two types of legislation: bills addressing VDT ergonomics, requiring installation of things like adjustable keyboards and chairs and glare reduction screens, and a bill giving employees a "right to know" the specifications of VDT machines.

To date, VDT safety bills have only been filed in Massachusetts, which has the earliest filing deadline, 9 to 5's Taber said. That bill, sponsored by 9 to 5, the SEIU and the AFL-CIO, deals primarily with ergonomic issues. It makes the state's Department of Labor and Industries responsible for enforcing regulations on semiannual inspections of VDTs, eye exams for employees and transfers of pregnant VDT workers.

NAS reassigns personnel

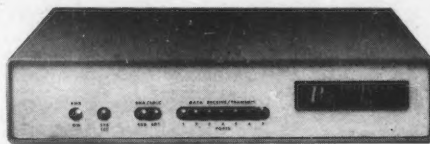
MOUNTAIN VIEW, Calif. — In an effort to "streamline operations to better deal with the increasingly competitive data processing industry," National Advanced Systems Corp. (NAS) on Dec. 10 reassigned some of its 1,150 U.S. employees and placed others on surplus status, according to a company spokesman.

The employees include roughly 70 people from headquarters and field services, according to an anonymous source. Personnel on surplus status will be paid for 30 days, during which they can interview for posi-

tions within National Semiconductor Corp., the parent company of NAS. After that period, these employees will officially be laid off.

The employee cutback is part of an NAS corporate directive to reduce the company's expenses by 20%, according to the anonymous source, who was uncertain what percentage the personnel changes would contribute. The NAS spokesman said that chances are very good that all employees will find jobs within National Semi, which has a worldwide work force of 42,000.

SAVE LOWER COST SAVE PROTOCOL CONVERTERS



THE NEW PCI SERIES 100
REDUCES NETWORK COSTS EVEN MORE!

- Dial Up Support
- Reduce Terminal Expense
- Increase Network Efficiency
- IBM PC Support Availability

MAKING THE NON IBM WORLD IBM COMPATIBLE

NEWCORP
PRODUCTS INC.
ASTON, PENNSYLVANIA

800-345-8278
In Pennsylvania Call (215) 485-8180

NEWS

Communications tools in spotlight at Dexpo West '85



**CW AT
DEXPO WEST**

By Jeffrey Beeler
CW West Coast Bureau

ANAHEIM, Calif. — Like most other users, customers in the Digital Equipment Corp. orbit are increasingly demanding gateways to the non-DEC world and networking capabilities of their own.

In response, hardware and software vendors have recently stepped up production of DEC-oriented communications aids, according to Steven Barth, marketing vice-president for Expoconsul International, Inc.

Probably nowhere was the DEC community's growing emphasis on systems integration more clearly in evidence than at the sixth national DEC-Compatible Industry Exposition (Dexpo) West '84 here Dec. 11-14. Of the approximately 280 vendors that exhibited at last week's Dexpo at the Disneyland Hotel Convention Center, 60 or 65 were demonstrating communications products, Barth said.

Hardware, software split

Barth, whose Princeton, N.J.-based company sponsored Dexpo, characterized the data transmission aids as split fairly evenly between hardware and software. On the hardware side were offerings like fiber-optic links, modems and statistical multiplexers. Software packages included local networking facilities, electronic mail programs and micro-to-mainframe links.

Many of the communications products displayed had already been on the market for quite some time, like IBM's family of Device Attachment Control Units, which reportedly allow IBM processors to swap information with their DEC counterparts.

But a few of the Dexpo-showcased transmission aids made their formal industry debut at the show. Some newcomers included the following:

- Ross Systems, Inc.'s Maps/Microlink, a software package that reportedly enables spreadsheets running on an IBM Personal Computer to share data with Ross' DEC VAX-based accounting and decision-support applications.

- Data Processing Design, Inc.'s Wordlink, which reportedly allows IBM Personal Computers or Personal Computer XT's supporting Wordstar or Multimate to gain access to VAX series mainframes.

- A Univision, Inc. controller board that is said to permit DEC Rainbow personal computers to be tied together to form full-fledged local networks.

- National Information Systems, Inc.'s Teleport II, a program that reportedly connects micros such as Rainbows and IBM Personal Computers to each other or to larger CPUs such as VAXs, Decsystem-10s and Decsystem-20s.

- An enhanced release of Exceptional Business Solutions, Inc.'s WPS-80, a Rainbow-based word processing package that, for the first time, can transmit documents among DEC micros running CP/M.

- Able Computer, Inc.'s Softswitch feature, which, with the vendor's Attach terminal system, report-

edly allows users of DEC Unibus processors to gain access to host CPUs, data files and applications.

Ross Systems' Maps/Microlink costs \$10,000 and is available from its developer at 1860 Embarcadero Road, Palo Alto, Calif. 94303.

National Information Systems' Teleport II, by contrast, costs \$5,000 for a basic license covering one mainframe and five micros and is available from the company at Suite 130, 20370 Town Center Lane, Cupertino, Calif. 95014.

Data Processing Design's Wordlink sells for a one-time fee of \$1,300, plus \$200 per Personal Computer and is available from the vendor at 1400 N. Brasher St., Anaheim, Calif. 92807.

Univision's local network controller board is priced at \$750, with the associated software costing an additional \$750 and can be bought from the firm at 1037 N. Fair Oaks Ave., Sunnyvale, Calif. 94089.

The enhanced release of Exceptional Business Solutions' WPS-80 package costs \$195 and is available from Suite J, 11738 Moorpark St., Studio City, Calif. 91604.

Able Computer's Softswitch communications feature licenses for a one-time fee of \$1,000 and is available from Able at 3080 Airway Ave., Costa Mesa, Calif. 92626.

Integration with other systems

For Barth, the comparatively

heavy concentration of communications-oriented products and vendors reflects a growing desire among DEC users to integrate their systems, not just with other DEC equipment models but with competitive gear as well — especially IBM's.

"Most of the people attending this show... want to find ways of getting more out of their current systems by attaching them to products from other vendors," he said.

Especially appealing to DEC users, he added, is the prospect of connecting their systems to the growing population of IBM micros or of integrating Big Blue's mainframes with VAXs operating in manufacturing and engineering environments.

Just published:

MVS TSO

Concepts • Commands • SPF • CLIST

If you're developing programs under OS/MVS, you're probably using some type of time-sharing system. If that time-sharing system is TSO, a new book called *MVS TSO* is for you. It zeroes in on the tasks a programmer has to do most often, so you can master TSO in a hurry.

Here's what you'll learn, whether you're using native TSO or SPF (a menu-driven version of TSO)

- how to create or change a data set or a library member
- how to allocate, display, print, rename, delete, move, or copy a data set
- how to compile, link-edit, and execute a program interactively
- how to debug a COBOL program interactively—that is, how to monitor the program's execution, look at the contents of data fields, watch the order in which subprograms execute, and so on
- how to start and control background processing for batch jobs (a background job doesn't run in your time-sharing region, so your terminal's not tied up as the job executes)
- why you have to use native TSO commands for some functions even if SPF is available on your system

In short, you'll learn everything you need to know to use TSO commands or SPF for program development.

For experienced TSO users:

How to use command procedures

MVS TSO will also teach you how to use command procedures, or CLISTS. A CLIST is a series of TSO commands and

statements that are executed in sequence (it's roughly equivalent to a JCL procedure). In this book, then, you'll find out:

- how to create and execute a simple CLIST for a specific job
- how to create and execute a generalized CLIST that can be used in a number of situations
- how to write a complex procedure that uses facilities much like those of a high-level language
- when and why you should write a program in a high-level language instead of using a CLIST

2 reasons why this book works

1. A technical subject like TSO is easier to master if you have plenty of practical examples to study. That's why *MVS TSO* is loaded with illustrations. For example, you'll find:

- before-and-after screen images that show you what values to enter into a screen and what the result will be
- TSO command formats that clearly explain each operand
- sample CLISTS
- schematic drawings that show how TSO works and how it relates to MVS

These illustrations not only help you understand TSO in the first place. They also serve as handy references when you're working at your terminal.

What's more, they teach you the basic patterns of TSO commands and SPF options. So you won't have any trouble looking up new features in the IBM manuals or other references when...and if...you need them.

2. This book is organized in a way we've found works well. After chapter 1 (an introduction to MVS and TSO), the book is divided into 3 parts: one each on SPF, TSO commands, and CLIST. So if SPF isn't available at your installation, you can skip that part and concentrate on native TSO. If you already have TSO experience, you can go directly to the part on CLIST.

In other words, you can study the parts you want to, when you want to.

So why wait to become a TSO expert?

Get a copy of *MVS TSO* today. I think you'll be delighted at how quickly you'll master TSO.

Our unlimited guarantee

You must be satisfied. Our books must work for you, or you can send them back for a full refund...no matter how many you buy, no matter how long you've had them.

To order, call 1-800-221-5528/In California, call 1-800-221-5527
When you call, please mention this ad code: T1/2

OR Mail the coupon below

Mike Murach & Assoc., Inc., 4222 W. Alamos, Suite 101, Fresno, CA 93711

Dear Mike: Please send me the books I've indicated below. I must be completely satisfied, or I'll send them back at any time for a full refund.

☐ *MVS TSO*, 454 pages, \$22.50
☐ *OS JCL*, 330 pages, \$22.50
☐ *OS Utilities*, 185 pages, \$15

☐ Bill me for the books plus shipping and handling (and sales tax in California.)
☐ Charge the books plus shipping and handling (and sales tax in California) to my _____ Visa _____ MasterCard:
 Card number _____ Valid thru (mo/yr) _____
 Cardowner's signature _____ (not valid without signature)

☐ I want to **SAVE** shipping and handling charges. Here's my check or money order for full payment. Calif. residents, please add 6% sales tax to your order total. (Offer valid in U.S.)

Name & Title _____
 Company (if any) _____
 Address _____
 City, State, Zip _____ T1/2

Mike Murach & Associates, Inc.
 4222 W. Alamos, Suite 101
 Fresno, CA 93711 • 209-275-3335

NEWS

DP chief at U.N. keeps tabs on worlds' worth of data

NEW YORK — Sidney Cashton has the world on an IBM. Global economic and social statistics are his daily bread.

Cashton joined the United Nations back in 1962 as a senior statistician. He is now an assistant director in charge of New York Computing Services, the group that provides computer systems and services to some 35 user offices throughout the organization, including Unicef, the U.N. Development Program and the World Hunger Organization.

His department specializes in applications that track world population, national economies around the globe, international health and hunger — "everything from soup to nuts," Cashton said.

"I've seen data processing grow from using an outside service bureau, spending \$10,000 a year for statistical processing, to what we have today, which is not an extremely large shop but a good-size shop serving a multitude of users," he explained.

"We have 85 people here that handle programming, analysis, development work and data entry for the

United Nations. We use two computers, an IBM 3081 and an IBM 4381 with [40G] bytes of disk storage, and we have about 300 terminals hooked onto our systems," Cashton said.

But the magnitude of DP operations at the U.N. cannot really be measured in taking inventory of the equipment or by looking at Cashton's \$5.5 million annual DP budget. The work done by the DP department here is far-reaching, serving users all over the world. Each word processing application, for instance, is custom-made because every U.N. report must be available in several languages (see story page 11).

"We've had multiple language capability on the mainframe since day one," he said. "What we did is, we got together with IBM and designed a train for the printers that contains the capability to print each line in combinations of English, French, Spanish and Russian. So the word processing capability that we now have got its start in the data processing department."

The scope of the organization also includes communications linkages



Cashton

"We are continually involved [with a flat budget] trying to ensure that we give the users adequate response with adequate facilities for their needs. It becomes extremely difficult after a while."

— Sydney Cashton, assistant director, New York Computing Services

with United Nations offices in Geneva and Baghdad [Iraq]. "We hope in the near future to link up Vienna and Bangkok [Thailand]," Cashton added.

One of Cashton's more recent responsibilities has been to set policies for the selection of the personal computers and related software, "which has been slowly making its way into the U.N.," he said.

Primary applications

He reported that personal computers were primarily requested by managers for spreadsheet applications, word processing and management information tools. He expects to have about 50 microcomputers in-house by the end of this year and around 200 by the same time next year.

Cashton said his biggest challenge for 1985 is "meeting the needs of the users — which are constantly growing — with the flat budget that's available to us."

"We are continually involved try-

ing to ensure that we give the users adequate response with adequate facilities for their needs," he explained. "It becomes extremely difficult after a while."

Micros would compound problems

Asked if he thought the influx of personal computers would relieve some of the demands placed on him by end users, Cashton — a self-proclaimed personal computer advocate — said personal computers would only compound his problems.

"The [personal computer] used in an industrial complex such as this is not usually a device that is used in a stand-alone fashion," he maintained. "In most instances, the people are using subsets of data that is available on the host computers. They're really just an adjunct to the large computer."

"I think they're great, but I don't think we have reached the point where we know how to use them effectively," he concluded.

Office management strategies on bill at annual AMS conference

PHILADELPHIA — A business film festival, symposiums on high technology and advanced management and a special panel titled "Managing the Office of 1990 and Beyond" will headline the 66th annual Administrative Management Society (AMS) International Conference June 16-19 at the Wyndham Plaza Hotel here. The conference also will feature a computer and office show June 17-19

at the Franklin Plaza Exhibition Hall.

Discounts of \$25 are available for registrations before April 1. Discounted nonmember prices are \$425, including five meals, or \$305 without meals. Discounted member prices are \$395 with meals or \$275 without meals. Single-day registrations are also available.

The AMS is located at 2360 Maryland Road, Willow Grove, Pa. 19090.

IBM 3274 Users. Multidrops And 32 Coax Channels on 1 Coax Cable.

That's right! Now, you can multiplex all the data between your IBM 3274 controller and up to 32 IBM 3274/9 terminals or printers on one RG-62A/U coaxial cable. Transmission distance is up to 3000 feet. No more hassle of pulling bundles of coax cables through overcrowded ducts. Most likely, the one required cable is already installed.

As a unique feature, the Fibronics FM-1670 System supports multidropping from that single coax cable to as many as four clusters of terminals or printers. Exciting flexibilities in network architecture are now possible.

For new installations, we recommend and offer a fiberoptic interface with the capability to transmit data up to a mile.

Here's more! The FM System offers simultaneous operation with two IBM 3274 controllers, back-up paths between multiplexers, and full diagnostics. Interested? Call us now. We're offering on-site demos and prompt deliveries at very affordable prices.

FIBRONICS INTERNATIONAL INC.
325 STEVENS ST.
HYANNIS, MASSACHUSETTS 02601
(617) 778-0700 Telex 951297

Fibronics
fiberoptic communications

CA/CICS.

FIVE WAYS TO GET CONTROL OF YOUR CICS NETWORK AND MAKE IT MORE USEFUL, MORE RELIABLE, MORE SECURE, AND MORE EFFICIENT.

CA-FLEXISCREEN

The industry's most efficient screen generation tool—fast, flexible, easy to use. Will greatly ease your programmers' work load.

CA-RAPS

Eliminates major system bottlenecks by allowing printing of power queue files at remote sites. Speeds report distribution as much as 10-fold.

CA-EZTEST/CICS

Automatic online testing and debugging facility that will save not just hours, but days. Menu-driven, self-teaching, and usable by even the most inexperienced programmers.

CA-JARS/CICS

Monitors CICS performance and provides complete job accounting. Pinpoints problems and lets you maintain maximum efficiency.

CA-SENTINEL

Provides both batch and online CICS protection in one product. Maintains data integrity. The proven effective way to achieve total data center security.

Get control of your CICS environment—call 800-445-3003 or (in NY) 516-333-6700 and ask for Dana Williams.



COMPUTER ASSOCIATES
Software Leadership Through Excellence

© 1984 Computer Associates International, Inc. 125 Jericho Turnpike, Jericho, NY 11753

NEWS

U.N.'s OA veteran saves her ammo for big problems

Structured approach to change allows focus on what's 'new or going wrong'

By Susan Blakey
CW Staff

NEW YORK — She moved from data processing into office automation instead of vice versa. She was an office automation manager before the term existed. Her biggest success is that everything she has implemented is doing what it is supposed to be doing.

This was how Carole Thompson described her career to *Computerworld* during a recent interview here. Thompson is the Coordinator of Technological Innovations in the Department of Conference Services (DCS) at the United Nations and has seen a hefty amount of innovation during her 19-year tenure with the U.N.

In the late 1970s, Thompson was selected from the U.N.'s data processing department to introduce Wang Laboratories, Inc.'s word processing system to the DCS. The DCS is a 1,700-member body that handles all meeting-related work at the U.N.

Thompson noted, "It's the largest department in the U.N. We handle the schedul-

ing of meetings, interpreting, translations and reporting. We print and reproduce in six languages [English, French, Spanish, Chinese, Russian and Arabic] about 60,000 documents a year."

Automating the department was no small task, and was further complicated by a fairly hostile user community that stalled the implementation of the project for more than a year. Eye strain, radiation and backaches were the cries from the would-be users. Thompson's DP background did not fail her, and she assembled a management committee and staff representatives to tackle the issues with which she was so familiar. After a long tug-of-war, the equipment came in.

"Ironically, we became known as the department that set the standards. People always call us for our guidelines. We've got a regular ophthalmologist; we let the people design their own work spaces; we've got some

of the best ergonomic chairs around," Thompson said.

Her philosophy on introducing change is simple. Un-

about things that are new or going wrong. This can only happen once you get rid of the day-to-day stuff."

Thompson has derived a great deal of satisfaction from knowing that people are comfortable and relaxed at work, and "they're not going home exhausted," as they had been before the automation.

She made a sports analogy about one of her biggest ongoing challenges: "You're shooting at a moving target. In a world where there are no standards, keeping up with changing technology —

keeping up with the unknown — is the most difficult thing.

"You're essentially forced to decide what to order for a given application before all the facts are in. You have to plan far enough in advance to construct your budget accordingly. In a sense, you're forced to budget only knowing half the story."

To date, Thompson has automated the English, French and Spanish groups at the U.N.; the Arabic group will be on-line during 1985, and the Russian and Chinese groups will soon follow.

She said she is happy with the way things are going and "delighted at the fact that it all works."

'In a world where there are no standards, keeping up with changing technology — the unknown — is the most difficult thing.' — Carole Thompson, U.N.

like plopping a typewriter on someone's desk, bringing in office automation requires a definite structure, she said.

"It's best if you concentrate on building a strong infrastructure so people won't be totally dependent on you. Each time you implement a system you have to pick a technical specialist — someone to act as systems expert and supervisor to train people and maintain the system. You have to off-load the day-to-day technical responsibilities as soon as possible.

"This way, I can keep my department small and lean, which is what I prefer," she added. "I only want to hear

ADVERTISEMENT • ADVERTISEMENT •

Directories List 32,000 D P Users

Each directory of computer installations lists 16,000 computer users covering the NY Metro Area (NY, NJ & CT), and the Mid-Atlantic States (PA, VA, MD, DC, WV & DE).

Each site includes a profile of the hardware installed, software installed, (languages, databases, etc.), consultants used, future

plans, applications and DP executives' names, titles, and phone numbers. An index provides quick access to 133 cross-references by hardware, software and industry. Price: NY-\$370 and MA-\$295. Call (212) 683-0606. Computer Management Research, Inc. 20 Waterside Plaza, NY, NY 10010.

Get the graphics picture in March Special Report

What do users want from graphics systems and software, and how can DP managers best meet their needs? Find some answers in *Computerworld's* March Special Report on graphics systems.

The Special Report will focus on mainframe and microcomputer graphics and the blurring line between the two. It will examine computer-aided design for microcomputers and easy-to-use graphics for mainframe systems. The report will feature both stand-alone and integrated applications and will discuss emerging graphics standards.

Contributions to the Special Report should take one of two forms: either a tutorial article discussing issues

or trends or an application story outlining a particular user firm's experience.

Articles may range from four to six typed, double-spaced pages. Artwork, such as charts, graphs and photographs, is also welcome.

Authors should include a brief biography and a telephone number at which they can be reached.

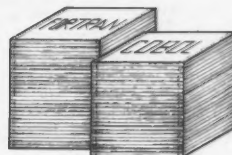
The submission deadline for the March Special Report is Jan. 25.

If you have a story you would like to tell, an issue to speak on or any questions to ask, contact Janet Fiderio, Special Reports Editor, *Computerworld*, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.



'Heck dad, I meant computer software!'

ACCENT R CUTS CODE 80%!



More power for your DEC-10/20, VAX*

CUT CODE

ACCENT R can cut your code up to 80%. ACCENT R's 4th generation language incorporates a unique concept that models the various data processing components. These models result in 80% less code than required by FORTRAN or COBOL.

SAVE TIME

Less code means less programming and debugging time. But that's not the only way ACCENT R can save you time. ACCENT R's powerful non-procedural language provides a complete range of commands so end users can easily add, change and delete data items.

CUT COSTS

Naturally if you save time, you save money. Programmers produce more applications in less time. End users generate their own reports and put less demand on the data processing professionals. And both programmers and end users are happier. Satisfied employees means less turnover.

SAVE YOUR SANITY

If you are using a DEC 10 or 20 now but see a VAX in your future, rest easy. ACCENT R is migratable software. DEC 10/20 today, VAX tomorrow. A syntactically identical version makes migration easy; special pre-release pricing makes it affordable.

*VAX version available late 1984.

For more information send to: 20370 Town Ctr. Lane, #130, Cupertino, CA 95014
408/257-7700



NATIONAL
INFORMATION
SYSTEMS, INC.

Name _____
Company _____
Address _____
CPU _____ Phone _____

NEWS

Geisco repositions as telecommunications carrier

Firm to market Softran-based interface, file transfer, connector, communications software

By Bryan Wilkins
CW Washington Bureau

ROCKVILLE, Md. — General Electric Information Services Co. (Geisco) recently announced plans to reposition itself from a remote computer services company to an enhanced telecommunications provider offering electronic software distribution.

Geisco, a subsidiary of General Electric Co., said it will offer users electronic software distribution through its network warehouse software supplies and distribute — in conjunction with Bonneville Telecommunications Corp. of Salt Lake City — products to multiple points

via the unused portion of FM radio waves. The firm has also released four software packages for the micro-mainframe environment.

Geisco said it has spent \$80 million to develop its enhanced product line, which will be commercially available by the end of 1985, according to Bob McCalley, general manager of enhanced telecommunications operations.

The electronic software distribution service through Geisco's Mark III network is aimed at the 1,000 to 3,000 users who make up the Fortune 1,000 market, McCalley said. "The whole intent [of our repositioning] is

to move information from intelligent providers," he added.

The areas of emphasis for Geisco, McCalley said, were value added, intelligent networking, office communications, micro integration with mainframes, professional services, electronic data interchange and remote computing.

McCalley said the company, which recently added GE's Intelligent Communications Services division as part of its business, has been beta testing the new software distribution products for one year outside and inside the company.

The major products announced by

Geisco were based around its Softran Services, an electronic software management and distribution system. Users will be able to electronically distribute their own proprietary software programs, data files, test messages or spreadsheet templates. Additionally, Geisco also said it intends to be a retail distributor of commercially available software packages for micros and mainframes.

Softran is priced at \$100 per package, plus there is a charge for each transaction — typically \$6 to \$24 per electronic download.

Softran is composed of two elements: an administrator module on Geisco's Mark III service and an end-user module for each micro. The administrator maintains a library of software for browsing and selection. The administrator can permit or deny end-user access to software and track usage for audit control.

Micro-mainframe packages

Four micro-mainframe software packages associated with Softran released by Geisco were:

- The Systems Interface, which provides enhanced interactive communications between micros and public network services such as CompuServe, The Source, Dow Jones and Mark III services. It is priced at \$50.

- A File Transfer Utility, allowing rapid, error-free transmission of binary and ASCII data between micros and Mark III services over asynchronous communications lines. It is priced at \$100.

- The Connector, which provides error-free data exchanges between micro spreadsheet packages and data files residing on Mark III service in an automatic reformatting conversion. It is priced at \$100.

- Mark III Professional Workstation, a full screen micro-mainframe communications software package with flow control, full screen editing, print spooling and file transfer. Available electronically and by diskette, it is priced at \$100.

Geisco also announced an agreement with Bonneville that will permit point-to-point and point-to-multipoint communications using satellite feeds to FM radio stations, which then transmit data over the FM sub-carrier frequency to users who can receive information with addressable devices.

Bonneville has current contracts with 50 FM radio stations in 50 U.S. cities, according to President Kenneth J. Bentley. Two-way communications with a data provider and the end user via the FM satellite is made through the Geisco network.

Bentley said the service currently in operation can be used by grocery and other retail chain stores to transmit pricing changes, advertising promotions and other announcements, as well as stock and commodity price changes.

The end-user receiver/demodulator that translates the FM feed into an RS-232 communications port on a micro is manufactured by Bonneville and costs \$610.

Finally, Geisco said it would also provide QuikWare, an electronic software warehouse users may browse through at \$10/hr in search of software packages.

Realia COBOL. Migration without migraines.

Until recently, you had to abandon the business computer language when you developed micro-computer application software. The available micro COBOLs were inadequate—too limited, too slow. The best alternative—the XT/370 or AT/370 using IBM's COBOL—was very expensive and still too slow. To get acceptable performance, you had to retrain your programmers in Pascal or C.

Realia COBOL is the cure for such headaches.

Realia's compiler supports most IBM VS/COBOL and VS/COBOL II features, such as:

- COMP and COMP-3 data
- SELECT assignment names
- Multiple entry points
- GOBACK, EJECT, and SKIP statements
- Structured programming extensions of VS/COBOL II.

You can download mainframe systems for development, maintenance, and testing. Productivity will soar.

You can compile faster with Realia COBOL than in most mainframe environments, even on floppy-based systems. Compile-time options allow cross-reference, brief and full code listings, and helpful features like subscript and decimal value checks.

Our interactive debugger lets you follow the program source, display and modify data, and set breakpoints using the normal optimized machine code.

The results are startling.

Our users report that their systems run up to 20 times faster when compiled by Realia COBOL. That's compared to our nearest micro competitor. The ratio is up to 100 times faster when compared to any of the others.

On the IBM PC AT, your programs can run at 370/148 to 370/158 speed. Realia's file system really makes your machine deliver, giving it a distinct edge over Pascal or C. Our indexed file system even has full key compression and buffer controls just like VSAM. The generated code is pure MS-DOS, so it can be run on most of the 8088/8086 machine family.

And you can sell your programs without paying us a royalty fee.

Realia COBOL is priced at \$995, including one year of maintenance and upgrades. Subsequent maintenance and upgrade contracts are currently priced at \$125/year/copy. Available for the IBM PC, PC XT, 3270 PC, PC AT, PC-compatibles, and the TANDY 2000.

Realia COBOL. What a relief.

IBM, IBM PC, PC XT, 3270 PC, XT/370, PC AT, and AT/370 are registered trademarks of International Business Machines Corporation. MS-DOS is a registered trademark of Microsoft Corporation.

**Professional Software
for the Personal Computer**

**REALIA
inc.**

10 South Riverside Plaza
Chicago, Illinois 60606
(312) 346-0642

NEWS

DP forecasters often still in dark despite CPE tools

Conferees cite impact of fourth-generation languages, capacity shortages as concerns

By Kathleen Burton
CW West Coast Bureau

SAN FRANCISCO — Though sophisticated computer performance evaluation (CPE) tools are flooding the market today, forecasting future computing needs is still a hit-or-miss proposition for many DP professionals.

So said a group of CPE analysts and end users surveyed at the recent International Conference on the Management and Performance Evaluation of Computer Systems here.

In addition, several users voiced concerns over the assimilation of personal computers into the DP environment, the impact of fourth-generation languages, the lack of integration between systems and the recent increase in capacity shortages due to improper planning by users.

CPE tools flooding the market

Bert Palamaro, manager of computer performance evaluations at Crum & Forster Insurance, Inc. of Morristown, N.J., said that even with the sophisticated CPE tools that are flooding the market today, DP managers still tend to underestimate future capacity resource needs consistently because of poor forecasting, changing specifications and pilot

'DP managers still tend to underestimate future capacity resources consistently because of poor forecasting, changing specifications and pilot samples that are too small.'

—Bert Palamaro, manager of Computer Performance Evaluations at Crum & Forster Insurance, Inc.

samples that are too small.

Palamaro also said the most promising new CPE tools are those for measuring and forecasting networking performance and for transferring networked data to mainframes for analysis and integration.

According to Palamaro, the most important criterion a data processing manager should use to judge these new CPE tools is, "will they help our department meet the service levels that have been set?" The object of CPE tools is to allow installations to maximize the returns on their hardware and software investments, he said.

Dr. Hubert Engelbert, assistant vice-president at Irving Trust Co., a financial management firm based in New York, claimed that exceptional new CPE products have recently

emerged for evaluating network performance and for Dasm management.

Users may face capacity shortages

Despite these product improvements, however, Engelbert said that many users will underestimate the impact of new applications on capacity and performance and will face severe capacity shortages over the next several years as a result. "Commonly, new applications have a much more demanding impact on systems than was originally planned for," he warned.

Lionel Silva, a data processing capacity planner at Amdahl Corp. in Sunnyvale, Calif., said that some CPE tools, such as a recently released MVS real-time analyzer presently being manufactured by several vendors, are "breaking new ground in the industry."

According to Silva, personal computers will play an increasingly im-

portant role in CPE capacity planning. "Attitudes have changed, and now corporations see personal computers as an asset to be managed, not just as an unintegrated orphan child," he said. However, Silva cautioned, users do not always know if a microcomputer will add to or subtract from a system's capacity, a problem that often results in severe capacity shortages for unsophisticated users.

Problems of inadequate capacity are also due to the increasing use of fourth-generation software languages, which, he said, require a great deal more processing than lower level languages.

George Simon, an analyst for the Teleprocessing and Technical Services Division of the Prudential Insurance Co. in Fort Washington, Pa., said that CPE tools have not been able to keep up with the pace of change in hardware technology, with the result that lack of integration between systems is the major problem facing the data processing world today.

According to Simon, another critical problem in the industry is that, because of their widely divergent needs, users and capacity planners speak different languages. As a result, he said, users and operational CPE planners are often at loggerheads on critical CPE issues.

Report on user satisfaction with WP systems released

DELRAN, N.J. — Datapro Research Corp. has released a report on user satisfaction with word processing systems.

The report was based on the firm's seventh annual survey of more than 27,000 users of word processing systems, in which 3,400 responses were tabulated.

According to Datapro, users rated their equipment against 10 criteria concerned with systems operation and reliability, peripheral reliability, responsiveness and effectiveness of service, technical support, actual performance compared to anticipated performance and overall satisfaction.

The study found that manufacturing companies reported the greatest

usage of word processing systems, with government and educational institutions, banking and financial organizations and insurance and legal firms continuing as major users. The study also revealed that purchase is the most popular means of acquisition.

Datapro said the highest ranked systems were NBI, Inc.'s Oasys 3000, Oasys 8 and Oasys 64, followed by the CPT Corp. 8500 Series and 8000/8100, the Compucorp Omega 60 and the Exxon Office Systems Co. Exxon 500.

The report, rating 63 word processing systems, costs \$29 and is available from Datapro, which is located at 1805 Underwood Blvd., Delran, N.J. 08075.

Speech Tech '85 show to focus on voice I/O applications

NEW YORK — The Speech Tech '85 Voice I/O Applications Show, sponsored by Media Dimensions, Inc., is scheduled April 22-24 at the Vista International Hotel here.

Attendees will be able to discuss voice I/O applications for telecommunications, defense electronics, robotics, medical instrumentation and quality control and as aids to handicapped workers.

The scheduled keynote speaker is Michiyuki Uenohara, executive vice-president of R&D at NEC Information Systems, Inc. in Japan. Other speak-

ers include Richard Wiggins from the computer science department at the University of Texas; Janet Baker, president of Dragon Systems, Inc.; and Edward Neuberg, research manager at the National Security Agency.

The conference will feature field trips to facilities using voice devices, a tutorial for potential users and vendor exhibits.

The registration fee is \$195 for three days and \$75 for one day.

Media Dimensions may be reached at P.O. Box 1121, Gracie Station, New York, N.Y. 10028.

THE NEW PC ERGONIZER,™ EVERYTHING AT YOUR FINGERTIPS, AT A PRICE WELL WITHIN YOUR REACH.



The PC Ergonizer is the ultimate workcenter for the personal computer.

The ergonomic design puts all systems components and workspace within immediate reach. The pull-out keyboard and workshelves have been engineered to relieve physical strain.

Both the keyboard and optional VDT compartments come with lockable aluminum tambour doors.

The PC Ergonizer can be easily rolled on its heavy duty carpet casters to any location.

The PC Ergonizer is designed to accommodate most personal computers, monitors, printers and peripherals.

All in one attractive, superbly constructed workcenter.

For more information

send the coupon below or call Hamilton Sorter 1-800-543-1605

☐ Send me complete color literature.

CW-12784

☐ My requirement is immediate, please have a representative contact me today!

Name _____

Title _____

Company _____

Address _____

City _____

State _____

Zip _____

Phone _____

**HAMILTON
SORTER CO.,
INC.**

3158 Production Drive, P.O. Box 8,
Fairfield, Ohio 45014
Tel. 513-874-9498 or 1-800-543-1605

NEWS



**WASHINGTON
UPDATE**
Mitch Betts
CW Washington Correspondent

Tax reform proposal may deter start-ups

WASHINGTON, D.C. — Officials from the American Electronics Association (AEA), at a recent press briefing, expressed concern that one provision of the Treasury Department's proposal for tax reform could choke off the venture capital needed by high-risk computer start-up firms.

William G. Moore Jr., newly elected AEA chairman and president of Recognition Equipment, Inc. of Dallas, told reporters he had sent a tele-

gram to President Reagan commending the Treasury plan in general but strongly opposing termination of the capital gains tax preference section for high-risk investments [CW, Dec. 10].

Moore said the lower capital gains tax rate, in effect since 1978, has stimulated growth in the electronics industry and created new jobs.

Loss of the tax preference would sharply reduce the ability of small, start-up firms to get investment capital and weaken the industry's competitive position in world trade, he said.

The AEA supports Treasury proposals to lower the industry's effective tax rate and revive the 25% tax credit for research and development. Moore said these benefits would help the large, established firms but added that the small start-up firms

would be harmed by the capital gains tax hike.

President Reagan vetoes NBS robotics program

WASHINGTON, D.C. — President Reagan recently vetoed legislation that would have created a \$250 million federal research program at the National Bureau of Standards (NBS) to foster robotics and other automated manufacturing techniques.

Congress had approved the legislation (H.R. 5172) earlier this year as part of the NBS budget authorization for fiscal 1985, with support from the Robotic Industries Association [CW, Oct. 22].

In a statement detailing his objections to the bill, Reagan said that the

variety of research, development and education programs would cost \$250 million during fiscal years 1985-1988 and would "represent an unwarranted role for the federal government."

Reagan said, "Decisions on how to allocate investments for research on manufacturing technologies are best left to American industry." Furthermore, he said the proposed programs "could also serve as the basis for a federal industrial policy to influence our nation's technological development," an approach strongly opposed by the administration.

Commission supports Cabinet department

WASHINGTON, D.C. — The President's Commission on Industrial Competitiveness will recommend creation of a Cabinet-level Department of Science and Technology and a permanent federal tax credit for R&D expenditures, a commission spokeswoman confirmed recently. The panel held its final meeting Dec. 7.

The spokeswoman said the new Cabinet department is needed to "transform the current, fragmented formulation of policies for science and technology into one that would be far more effective in meeting long-term goals." Further explanation of the proposal is expected when the commission releases its final report in January or February.

The commission, chaired by John A. Young, president of Hewlett-Packard Co., was created by President Reagan on June 28, 1983. Its charter was to "review means of increasing the long-term competitiveness of United States industries at home and abroad, with particular emphasis on high technology and provide appropriate advice to the president through the Cabinet Council on Commerce and Trade and the Department of Commerce."

Infomart site of Uniforum '85 conference

DALLAS — Uniforum '85, the International Conference of Unix Users, will be sponsored by Usr/Group at Infomart here Jan. 21-25.

Fourteen all-day tutorial sessions will be held Monday, Jan. 21, and conference sessions are scheduled in four tracks: office systems, personal computers, engineering/programming and market trends.

Vendors of AT&T's Unix hardware, software and services will exhibit their products at the international event.

Registration prices are as follows: for the show only, there is no fee if preregistered, and registration is \$10 on-site; for the tutorials, there is a \$100 fee if preregistered and it costs \$150 on-site; and the price for the conference is \$125 in advance and \$175 on-site.

Special conference rates apply for members and students.

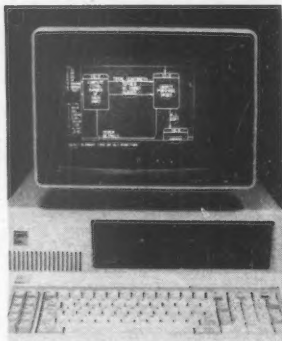
More information is available from Uniforum, which is located at Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.



OUTDRAW THE COMPETITION FOR ONLY \$500

Extend the capabilities of your IBM PC. With DFDdraw from McDonnell Douglas Automation Company, you can now draw and edit Data Flow Diagrams, using DFDdraw's automated template of all data flow diagram graphics symbols and its comprehensive diagram manipulation features.

DFDdraw features include scaling and sizing for changing diagram dimensions, and pan and zoom for easy editing and viewing. DFDdraw simultaneously moves data flows and text. Hardcopy can be provided on both the Epson FX80 or FX100 printer and Hewlett-Packard desk plotters.



DFDdraw operates on an IBM PC, XT or AT having at least 256K memory, with standard IBM color monitor and color graphics monitor adaptor. Compatible products are also supported.

The price is impressive, too—just \$500. So expand your PC. Order DFDdraw today.

A demonstration disk is available for \$15. Send check or money order to McDonnell Douglas Automation Company, Dept. K277, Box 516, St. Louis, Missouri 63166. Or ask us to bill you.

You can also order by calling us at 1-800-325-1087. In Canada, call (314) 233-8997.

McDonnell Douglas Automation Company
ON THE INFORMATION FRONTIER.

©1984, McDonnell Douglas Corporation

NEWS



CW photo by T. Henkel

William Moore

The American Electronics Association (AEA) is composed of 2,700 member companies. The members represent various aspects of the electronics industry, including manufacturers and suppliers of computer systems and peripherals, semiconductors and other components. The organization claims that 75% of its membership is small companies employing fewer than 250 people.

Recently, Computerworld Senior Editor/Systems Tom Henkel interviewed the newly named chairman of the organization, William Moore. Moore, who is also president of Dallas-based Recognition Equipment, Inc., began the one-year term as AEA chairman Nov. 30. For the past two years, Moore has served as a member of the AEA's executive committee, and he has been a director of the organization for the past four years.

Q The AEA has been warning that the U.S. might lose its competitive edge in the world electronics market. So far, those predictions have not come true. Has the AEA changed its position?

The relative position of the U.S. in the electronics industry is still of concern to us. One area where the U.S. will probably lose its edge this year is as an exporter of electronic equipment. We had a positive balance of trade last year, but marginally so. It looks like we are going to have a negative balance of trade in electronics this year.

There are a lot of reasons for this. One is the strength of the dollar, which affects our ability to sell products overseas. Another reason is the cost of capital, or the cost we have to pay vis-a-vis our Japanese competitors in getting capital for our businesses. The AEA continues to focus its lobbying activities in those areas. We'd also like to see the dollar become a reasonable standard for international trade without being an inflated dollar.

Q What about the trend of more companies manufacturing overseas?

I think you are always going to see that. There are a lot of incentives — not only access to foreign markets but also tax incentives for high-tech companies to go overseas. But you have to put that into context. The manufacturing side of the high-tech business this year became the largest manufacturing sector in the U.S., with 2.3 million jobs and a \$50 billion payroll. That is like four steel industries. The industry has been growing, and there have been a lot of new jobs created. If we continue at this growth rate, we will continue to create a lot of U.S.-based jobs.

Q Many start-up companies develop products that are closely patterned after successful products. For example, there was a flood of compatible products after IBM unveiled its Personal Computer. Currently, many companies are announcing workstations based on Motorola, Inc. 68000 series microprocessors. How do you feel about these look-alike products?

I have more of a personal opinion than an AEA opinion. Basically, what you are talking about is the free market action in the entrepreneurial part of the computer business.

Take, for example, the problems that the floppy disk companies are having. It was very easy for someone to get a bunch of technicians together, put them in a garage, go out and get \$2 million in venture capital and develop a floppy disk. But the market simply would not support that many products. So the people with the more marginal products are falling by the wayside.

You could argue the venture capitalists were excessive in financing all these companies. But in the net venture capital market between August 1982 and August 1983, almost anything they floated would sell. We had some excesses, and we're paying a price for those excesses now.

'A lot of these vendors [of look-alike products] are very resilient. If they try once and don't make it, a lot of them go back and try again.'

Q How do you view the long-term impact of look-alike products on U.S. vendors' ability to develop innovative products?

It probably leads to a fair amount of conservatism from a user's point of view. Once he's been burned once or twice by this phenomenon, he probably favors the major vendors, such as the standardization around IBM or IBM-compatible products.

But does it limit innovation? I don't think so. I think what you really end up with is the survival of the fittest. In fact, a lot of these vendors are very resilient. If they try once and don't make it, a lot of them go back and try again.

Q But if many small companies possess that resilience, what does that mean to users? For example, what is the user of a 68000-based workstation to do if two years from now the sup-

plier is developing Lisp machines or Ada machines?

Over time, the market is much less responsive to the entrepreneur for that reason.

'The Japanese will dominate [the optical disk area] because it will be a commodity product supplied to various vendors.'

Q One advantage to look-alike products is that they are typically developed with inexpensive off-the-shelf components. That has led some industry observers to believe computer systems are becoming a commodity. Do you feel this is a trend? What future impact to you feel it will have on the electronics industry?

It has become fairly clear over the past few years that the Japanese are extremely competitive when it comes to commodity products. We have seen them dominate in the random-access-memory development area. We are also beginning to see the same thing in the optical disk area; the Japanese will dominate because it will be a commodity product supplied to various vendors for personal computers, home entertainment and big systems.

But when you get into the systems side, although you may use commodity products to piece together your system, it is clearly the systems software, the operating system and the overall performance characteristics of the system itself that are most important. And I think that is where the U.S. will be preeminent, both as a manufacturer and exporter. You just have to understand that it is very difficult for us, given our short-term profit orientation, to be consistently cost-competitive in investing the amount of development funds you need to have these first-rate commodity products.

Q The term "industry standard" is applied to many products in the electronics business. How do you feel about standards developed by recognized standards organizations such as the International Standards Organization and the American National Standards Institute?

The best thing that has happened to the computer business, in my opinion, has been the proliferation of the personal computer. Because now you have people like you and me trying to plug a printer into a printer interface, trying to initialize a disk and trying to load a very fundamental piece of

See MOORE page 16

NEWS

Firm to launch satellite-based micro teletext system

By John Dix
CW Staff

NEW YORK — A two-year-old company here is readying an information distribution system that will marry satellite and teletext technology to enable information providers to disseminate data to personal computer users.

Satellite Network Delivery Corp., which was founded with seed money from the Tribune Co. of Chicago and recently raised more than \$2.5 million from a private placement by Cralin & Co., an investment banking and retail brokerage firm in New York, is building a teletext-based network targeted at business use.

Capacity of the company's Business Teletext Network (BTN) will be leased to information providers such as brokerage houses, investment services and publishers. These firms reportedly will use the system to distribute business information, provide quotation services for securities and commodities trading, distribute advisory services and broadcast electronic mail to personal computer users outfitted

with special decoders.

A central BTN computer facility in New Jersey will accept real-time data from information providers. After formatting the data for network use, this computer will transmit the information via satellite to television studio receive-only satellite earth stations located in the top 75 markets across the country.

Data inserted in VBI

Participating television stations, many of which the company has already reached agreements with, will be outfitted with BTN-provided electronics that will insert the received data into the broadcaster's vertical blanking interval (VBI) for distribution like regular television signals. The VBI is the black line that appears between picture frames when the vertical hold on a television goes out of whack.

Information bundled into the VBI will be broadcast to and received by addressable tuner/decoders that service subscribers will attach to their personal computers. The memory and intelligence of the personal computer, coupled with the decoder's

memory, will enable the user to view the information as it is being received or save the information for later use.

BTN plans to retain control of all user decoders, which will enable it to add and delete subscribers by remotely turning the decoders on and off. The identification number of each decoder will also enable BTN to address closed user groups or filter out information for delivery to specific subscribers.

When completed, the BTN network will reportedly be capable of supporting hundreds of concurrent information services. Each of these services can operate at its own speed.

Users will reportedly be able to use their personal computers and a single tuner/decoder to seize and save information — either directly or in an unattended mode — from several subscriptions, even if they are transmitted at the same time. Ad-

ditionally, the decoders can be equipped with a decryption capability to lessen the likelihood of service piracy.

The company anticipates that the network will be used during business hours to distribute real-time information and that after-hours it will be used mainly to distribute larger amounts of data. A subscriber's personal computer, interfaced with a 9,600 bit/sec tuner/decoder, would enable a user to capture 5M bytes of information in an hour and a half, the company estimated.

In practice, an information provider could use this capability by downloading a large data base once every three weeks, for example, and update that information daily to keep it current, the company reported.

Although service costs are still uncertain, the firm estimated that user decoders will sell for approximately \$200. Information providers network contract costs will reflect projected use. The network is scheduled to be operational by the end of next year.

TERMINALS FROM TRANSNET

PURCHASE PLAN • 12-24 MONTH FULL OWNERSHIP PLAN • 36 MONTH LEASE PLAN

DEC	Authorized Distributors — Carry the COMPLETE lines of:	MONTHLY RATES			OR Purchase
		12 mo.	24 mo.	36 mo.	
DEC	LA50 Personal Printer	5.62	3.35	N/A	CALL FOR DETAILS
	LA120KSR DECwriter III	220	122	83	
	VT101 CRT Terminal	115	64	43	
	VT102 CRT Terminal	127	75	51	
	VZ220 CRT Terminal	116	65	45	
	VZ240 CRT Terminal	130	75	50	
TI	VZ281 CRT Terminal	190	109	73	CALL FOR DETAILS
	TI707 Portable Terminal	62	35	N/A	
	TI820KSR Terminal Pkg.	211	117	80	
	TI850 Printer w/Trailer	37	22	N/A	
	TI855 Dual Mode Printer	86	48	32	
	TELE-VIDEO TV914 Tilt Swivel CRT	62	35	N/A	
TELE-VIDEO	TV950 CRT Terminal	103	57	39	CALL FOR DETAILS
	TV970 Tilt CRT Terminal	115	67	43	
NORTHERN TELECOM	N76K00 Displayphone	124	69	47	CALL FOR DETAILS
	N76K55 Modem 212 A	47	26	N/A	
C/ITON	CIT101 Video Terminal	105	58	39	CALL FOR DETAILS
	CIT114A Graphics Terminal	134	74	50	
	CIT1300 W.P. Terminal	181	108	72	
	CIT400 Line Printer	337	298	201	

ON-SITE TECHNICAL SUPPORT & SERVICE

PERSONAL COMPUTER SYSTEMS

Visit our computer stores in Union and Ocean, NJ

AUTHORIZED RETAIL DEALER

APPLE IIe, IIc, MAC, III and LISA — DEC RAINBOW — TI PROFESSIONAL

SUPPLIES — FREE CATALOG — CALL

TRANSNET CORPORATION

1945 ROUTE 22 — UNION, N.J. 07083

IN NJ (201) 688-7800 • (800) 526-4965 • TWX 710-985-5485

CICS/TCA™

- **Automatic Testing** — CICS/TCA automatically (and quickly) re-runs any testing which was previously done under its control.
- **Documentation** — CICS/TCA can print the input and output transactions from a terminal session in a variety of formats.
- **Auditing** — CICS/TCA can be used to audit the transactions being performed at remote or unattended terminals.
- **Change Control** — CICS/TCA identifies all changes in terminal output from an application.

BRASK SYSTEMS INC.

4805 Pershing Road • Downers Grove, IL 60515
(312) 971-3088

BECOME A VSAM EXPERT.

SysEd's new 5-day VSAM course will make you a VSAM expert. You'll not only learn how VSAM works, but how to make it work well, and what to do if things go wrong. Even if you're already using VSAM, you'll gain a better understanding of its capabilities and flexibility... like how to select among the options VSAM offers for configuring data sets, both batch and on-line.

Our hands-on case study instruction begins the very first day. You'll write and test three real-life programs and use Access Method Services on our own 4341/II computer. There are eight 3270 terminals dedicated to the class. You'll receive individual attention from our experienced teachers, and you'll want to bring your actual programming and debugging problems to class.

SysEd's VSAM course contains the most up-to-the-minute information available anywhere, including the latest features and capabilities of VSAM, and is in line with state-of-the-art hardware.

SysEd courses are held weekly and on weekends at our training centers in New York City, Chicago, San Francisco and Dallas. On-site courses at your own computer installation are also available. Classes are limited. For early enrollment or more information call Dave Shapiro (212) 564-9147

SYS-ED™

35 West 35th St. off Fifth Ave. New York, NY 10001

MOORE from page 15

software. Suddenly, the users of computers are no longer taken in by the idea of some all-encompassing set standards that will make their lives easy.

From this point forward, other than broad standards — such as how to shake hands in a communications protocol — standards are going to become less important because the user is more sophisticated.

The reason IBM was so dominant in the 1950s and 1960s was the user didn't want to be bothered. He wanted someone to hold his hand for him. And IBM was great at that.

Q How do you feel about the so-called "de facto" standards that center around popular products? Are these really industry standards or simply market trends that will change in a short time?

Standards really mean that you have second and third sources for something.

I want to know that if I choose an Intel Corp. micro-processor as the basic building block of a system, there will be three or four other sources of supply — especially if IBM buys everything Intel builds. So I want to make sure there is a standard to make that particular chip.

Then there are interconnect standards. Basically, I want to know how I get onto a network, but it is more analogous to the telephone network.

What we are really looking forward to is to allow all these computer terminals to be able to talk to each other over some common network.

Is Your Payroll Tax System Hogging Your Time?



Chances are your payroll taxing software is hogging unnecessary amounts of time, money and resources. BSI-TAX can change all that.

You can save because BSI-TAX is the most extensive software for payroll taxing ever developed.

- Easily updated by non-DPERS
- Not compiled for tax changes in five years
- 400 + consecutive tax updates supplied without an error

- Available in COBOL and RPG III for minis and mainframes

Put payroll tax changes in the payroll department. Get rid of the payroll tax hog. With BSI-TAX you save time, money and resources.

BSI

Business Software, Inc.
3957 Pleasantdale Rd. / Suite 107
Atlanta, GA 30340
(404) 449-3200

Xerox announces a 15-year headstart in Artificial Intelligence.

XEROX

You've read the announcements. Lots of companies are climbing aboard the AI bandwagon.

But if you're looking for an AI system that you can use *right now*, no other company can offer you the experience, the resources and the commitment of Xerox.

Fifteen years ago, Xerox pioneered systems that were fundamentally different from those used by regular computers, that could think not only sequentially, but symbolically, that could mimic various reasoning processes of human intelligence—deduction, induction,

classification and inference, among others.

The result is today's Xerox AI System, a combination of 1108 or 1132 workstations, software such as Interlisp D and LOOPS, our knowledge engineering tool, and the training and support to make it all work together.

Because our AI system can sift through mountains of data, evaluate them and arrive at intelligent conclusions, it has already proven invaluable to major corporations, government agencies, universities and research laboratories.

By helping oil companies investigate geological clues, it's saving millions of dollars in exploration costs. It's helping doctors think through physiological patterns, symptoms and clinical tests to diagnose disease. It's helping computer companies configure complex systems and financial analysts plot strategies.

The Xerox AI System is also Ethernet compatible and an integral part of Team Xerox, a wide array of products,

Team Xerox people and services to meet all your information needs.

Fill out the coupon and find out about what no other major corporation can offer you.

The keys to Artificial Intelligence are at Xerox.

Xerox Special Information Systems
Artificial Intelligence Business Unit
250 N. Halstead St., P.O. Box 7018, Pasadena, CA 91109
Attn: AI Marketing, M.S. 1245

☐ Please send me more information.

☐ Please have a sales representative contact me.

Name _____ Title _____
Company _____
Address _____ City _____
State _____ Zip _____ Phone _____

XEROX®, 1108, 1132, Interlisp D, and LOOPS are trademarks of XEROX CORPORATION.



NEWS

CCDA statistics show 90% of Canada's programs illegal

Software piracy, plagiarism cost manufacturers millions of dollars, increase prices

By Laura Jo Gunter
Special to CW

TORONTO — Just one out of every 10 software programs in use in Canada is a legally produced program. The remaining 90% of the programs here are either pirated or plagiarized, according to statistics from the Canadian Computer Dealers Association (CCDA).

In dollars and cents, this means a considerable loss to software manufacturers, society at large and even the end user. Industry analysts in the U.S. estimate that in 1984 alone, U.S. software producers will lose \$700 million in revenues to illegally copied programs.

Similar figures are not available in Canada, but the CCDA estimates that 10,000 jobs are lost annually in the software industry due to pirating. This costs the Canadian economy as much as \$100

million per year.

Perhaps surprisingly, piracy also hurts the end user. Software companies must raise the price of their programs to compensate for revenues lost to pirates. Scott Brown, technical public relations director for Ashton-Tate of Culver City, Calif., admitted that this phenomenon has caused his company to increase prices for its software. The reason, he said, is that there are three to seven times as many pirated copies of the company's software circulating than there are legitimate programs.

The actual act of piracy can be as innocent as a student following the teacher's instructions to copy a disk. It can also be as irredeemable as someone being in business solely to copy the valuable results of the labors of others. With nearly no overhead, the pirate can undercut the originator by so much that the originator has little chance of competing.

Obviously, it is the latter case that worries most legitimate software producers. This kind of piracy can take

one of three forms. The first type is the commercial pirate working out of a storefront, often going under the title of "software review club."

"This is the major way that pirates get around the law," maintained Bruce Hampson, president of the CCDA. "They tell the customer that he has to pay \$10 for a copying charge and then he can take the program home to evaluate it. After the evaluation, the customer is on his honor to destroy the copy and buy a legitimate program, but nobody will. They [the pirates] can claim that they're charging a copying fee and not selling anything, so they're not breaking the law."

This is not to condemn all review clubs. There are legitimate clubs that loan software for review and have it returned in much the same way as a book library system.

Then there are the pirates inside corporations. In this case, the pirates are saving money by buying one program and then making several copies to be distributed

among other employees.

This small network of users also fits the last type of pirate known as the "home hacker." These people copy software to sell or give to a small market, usually friends. This group is the largest in terms of the number of people involved but is the least likely to be prosecuted, Latner said, because they usually deal with less expensive software, such as game programs, in small quantities.

Because of piracy, software companies are developing sophisticated copy protection for their products. This makes it difficult, if not

impossible, for a legitimate user to make a backup copy in case something happens to the original.

"It's also hard to put software onto the hard disk," claimed Glen Siegel, president of the Personal Computer Club of Toronto. "It [copy protection] makes life more difficult. If you ruin the master disk, then you're out of luck until you get a new one."

Robert Mittler, director of information services at Bristol Aerospace Ltd. in Winnipeg, Canada, said that he would not mind the hassles if it would help the software developer.

Gunter is a staff writer for Computer World Canada, which is published by Ratray Publications Ltd. of Toronto.

GETTING COLD?

My small, profitable and growing Computer Service Bureau in WARM, comfortable Southern California is FOR SALE.

If you are a dynamic salesperson, a top-notch programmer, and a smart businessperson this could be the opportunity you've been looking for. At \$200,000 it's priced at less than 0.6 times gross and I'll finance up to 40% of it. Write to: CW-B4105, Computerworld, Box 880, Framingham, MA 01701.

SAS users meet set

RENO, Nev. — Users of SAS Institute, Inc.'s SAS family of products will get an opportunity to discuss new applications and discover new techniques at the 10th annual SAS Users Group International (Sugi 10) conference to be held at the MGM Grand Hotel here March 10-13.

According to SAS Institute, more than 2,500 users of SAS products are slated to attend the conference, which will kick off with a Sunday evening opening session hosted by SAS Institute. Sessions will cover such topics as capacity planning and evaluation, systems software, econometrics, time series and operations research, education and consulting, graphics, information systems, interactive techniques, microcomputers and mini-computers.

In addition to the sessions and a roundtable luncheon discussion, SAS/Graph users will submit their best efforts in the first SAS/Graph Competition and Exhibit. Entries will be submitted for "Best Presentation of Data" and "Most Creative Use of the Software."

Registration for Sugi 10 costs \$75. More information is available from SAS Institute, Box 8000, Cary, N.C. 27511.

IBM 34/36

More than 9,000 companies use Para Research software systems to make their computer a more productive business tool. Quality and reliability have made Para Research software a standard among IBM users. It's proven in companies from the Fortune 500 to companies with 50 employees. It's backed by comprehensive documentation and responsive customer support.

Good program design and clear documentation make our systems user-friendly. No complicated procedures involved. With Para Research software you get quick response and timely and accurate reports to improve every area of your business. We also offer accounting software for the IBM 338.

GENERAL LEDGER \$3,000

A multi-company system for up to 99 companies and departments. Run different periods and different accounting years concurrently. Run each company in the GL independently. Create a unique chart of accounts for each company. Run different year-end closings. Print financial statements for each company. Design your own report formats. Out-of-balance and data entry errors are flagged to insure accuracy. Complete audit trails are provided. Allows for both fixed and variable recurring journal entries, accrual reversals can be automatically generated. Consolidates up to 49 companies into one. Strategic Ratio creates 30 different financial ratios to analyze assets, liabilities and equity.

ACCOUNTS PAYABLE \$1,800

Handles every facet of accounts payable—from invoicing through issuance of checks. Various management reports provide up-to-date information on all payables plus complete audit trails. Cash requirement reports help you set payment priorities and take advantage of cash discounts. Displays open-payables for each vendor on your CRT. Allows you to take a discount amount after discount date, select a single batch of vouchers for updating to open payables file, and report status of every vendor on a vendor analysis report. Multiple line distribution for up to 19 accounts. System flags vouchers for payment.

PAYROLL \$1,800

Payroll provides up-to-date costs of specific tasks for every department in your company. Employee master files for salary, hours and other payroll items are easy to maintain. User-friendly prompts provide the customer with complete instructions for each procedure. Up to nine deduction types for each employee. Multiple payroll data reports including check register, W2 forms, QTD 941s and 10 other reports. Runs payroll for 99 companies and for any combination of companies. Provides void check register. Stores YTD and QTD data.

FIXED ASSETS \$2,000

A complete depreciation scheduling program that produces two-year projections. Figures depreciation over user-specified fiscal periods based on either the 1982 Economic Recovery Act using the Accelerated Cost Recovery System, the 1983 Reduced Basis ACRS or twelve other standard depreciation methods. Separate depreciation for federal tax, state tax and book. A series of management reports track depreciation schedules, report changes in those schedules, give projections over a two-year period. Complete tracking of assets including identification labels.

ACCOUNTS RECEIVABLE \$1,800

Improves bookkeeping efficiency and reduces administrative tasks. Available in either open item or balance forward methods. For both methods, the system has cycle billing capability and allows printing of all statements on file or statements for specific customers. You can obtain up-to-date status of customer records, including current balance, all aging information and credit status checking.

PARA RESEARCH

Call or write Software Sales, Dept. CS1, Para Research Inc., 85 Eastern Avenue, Gloucester, MA 01930 (617) 283-3438.

UNIX™ Computer Solutions

- VAX™ Family Systems (with 4.1, 4.2, or System V)
- IBM PC/XT/AT (with PC DOS™ or PCIX™)
- Maintenance & Support Contracts (Hardware & Software)
- Local Area Networks

Available Leasing Options
Immediate Delivery
Call our offices in California or Texas

(408) 986-8119
Santa Clara

(800) 231-9789
Houston

or in Texas
(713) 956-6210

South West Automation
Your one stop UNIX shop!

UNIX is a trademark of AT&T Bell Laboratories
VAX is a trademark of Digital Equipment Corporation
DOS is a trademark of Microsoft
PCIX is a trademark of IBM



Make
Stat Magic

**Statistics, reports and plots
happen magically with
SPSS/PC —the Statistical
Package for IBM PC/XTs.***

SPSS/PC is the most comprehensive statistical package for performing simple or complex tasks, regardless of data size. It maintains, features and language compatibility with mainframe SPSS, while optimizing for the PC environment.

Statistics range from simple descriptive to complex multivariate including Multiple Regression, ANOVA, Factor and Cluster analysis. Loglinear and nonparametric procedures are also included.

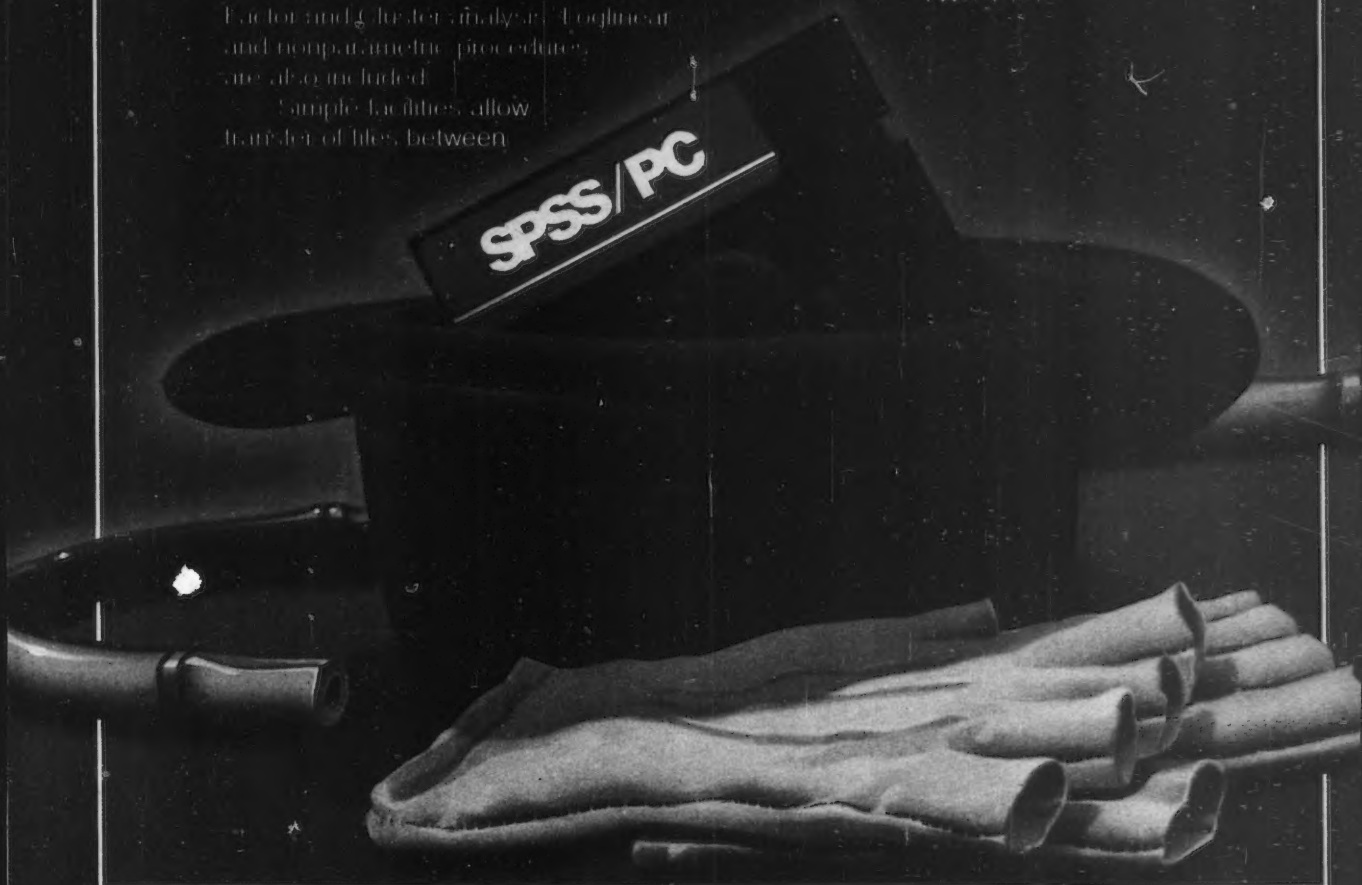
Simple facilities allow transfer of files between

SPSS/PC and programs like Lotus 1-2-3, dBase II and dBase III. A complete Report Writer, Plotting facilities, and a Communications program for mainframes round out a fully integrated product.

For more information, contact our Marketing Department without further delay. And see what a little stat magic can do for you.

SPSS Inc. 441 N. Michigan Avenue
Chicago, IL 60611 312/329-1400

In Europe: SPSS Benelux B.V.
P.O. Box 115, 4200 AC Gennep
The Netherlands. Phone: 31830 36711
TWX: 31010



SPSS inc. PRODUCTIVITY RAISED TO THE HIGHEST POWER

*SPSS/PC runs on the IBM PC/XT with 320K memory and a hard disk. An 8087 co-processor is recommended. Contact SPSS Inc. for other compatible computers.
IBM PC/XT is a trademark of International Business Machines Corporation. dBase II is a trademark of Ashton-Tate. 1-2-3 is a trademark of Lotus Development Corporation.
SAS is a trademark of SAS Institute, Inc. SPSS and SPSS/PC are trademarks of SPSS Inc. for its proprietary computer software.

Copyright 1984 SPSS Inc.

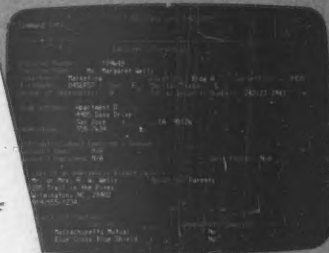
The SAS System...

Are your users demanding faster service and more business expertise than your data processing staff can offer? Is your DP staff demanding relief from its applications backlog? Is your management demanding lower development and maintenance costs? Put the SAS® System in your Information Center and you can meet all these demands.

“The SAS System is the one, completely integrated software solution to meet your Information Center needs.”

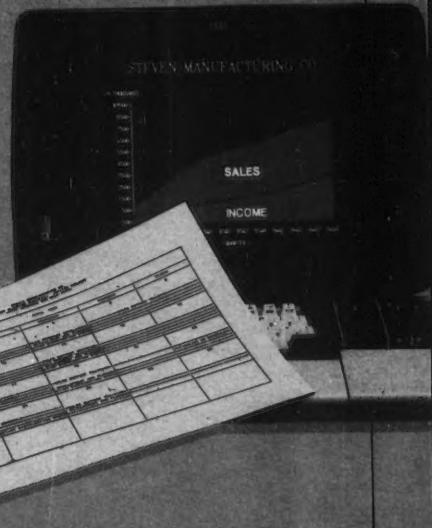
The SAS Solution for End Users

Your marketing staff can use the base SAS® product for sales reports and analyses. Sales representatives can use the full-screen capabilities in our SAS/FSP® product to manage their prospect files and the personnel department can keep track of employee and applicant records.



The accounting staff can quickly produce budgets and spreadsheet reports.

Your clerical staff can take orders, track inventories, and produce mass mailings. Managers can schedule projects and determine product mix with our SAS/OR® product, and combine the results to make accurate forecasts with our SAS/ETS® library of procedures. Then they can present the results of their work in easy-to-understand SAS/GRAPH® displays. All this and more with the SAS System.



With the SAS System, users only need to learn one language to accomplish all their tasks, and you only need to maintain one set of files for their needs. And one set of easy-to-read manuals and training aids. If they need more help, they can register for public training courses or you can schedule an in-house course for several users. We also develop videotapes to train your SAS users. And you can call us. Our full-time staff of specialists is ready to answer your questions.



“Our services help guarantee that our software will make you more productive.”

The Solution for Your Information Center

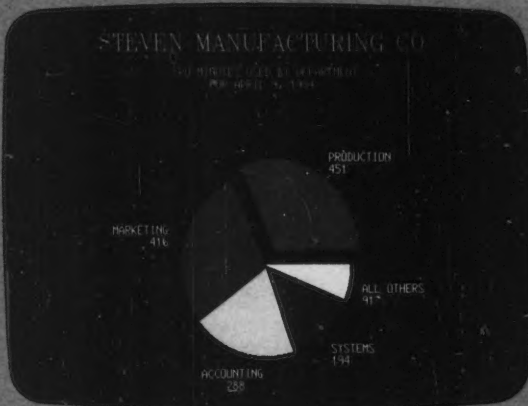
The SAS Solution for Programmers

Once your Information Center is equipped with the SAS System, your DP staff is free to use SAS programming tools to develop complicated reports and analyses, measure hardware resources or system usage, and accomplish many other jobs. Data base administrators can use our SAS/IMS-DL/I® interface to build test data bases and DL/I programmers can implement their IMS-DL/I applications using the simple SAS language.

And with our new SAS/REPLAY-CICS™ tool, your DP staff can develop and store SAS/GRAPH displays in overnight batch jobs, then give them to managers for easy, orderly replay on their CICS terminals.

STEVEN MANUFACTURING CO.
THE SYSTEMS GROUP BY REPLAYCICS
FOR JANUARY 1, 1984

DEPARTMENT	PROGRAM	CPU MINUTE				I/O MINUTE			
		USER	SYSTEM	READ	WRITE	USER	SYSTEM	READ	WRITE
ACCOUNTING	ACCT110	3	21.50	10.00	11070	2791			
	ACCT110	7	88.87	5.37	30960	6093			
	ACCT100	6	100.00	10.00	10000	10000			
	ACCT100	20	110.70	6.10	10000	10013			
LEGAL	LEGAL10	10	21.00	1.70	10010	1700			
	LEGAL10	10	10.00	1.00	1010	1010			
	LEGAL10	7	21.00	10.00	10010	1010			
	LEGAL10	6	100.00	10.00	10010	10010			
MARKETING	MARK10	7	10.00	0.37	10010	10010			
	MARK10	21	100.00	0.00	10000	10000			
	MARK10	17	10.00	0.37	10010	10010			
	MARK10	10	10.00	0.37	10010	10010			
SYSTEMS	SYSTEM10	10	10.00	0.37	10010	10010			
	SYSTEM10	10	10.00	0.37	10010	10010			
	SYSTEM10	10	10.00	0.37	10010	10010			
	SYSTEM10	10	10.00	0.37	10010	10010			
TOTAL		100	1000.00	0.40	100000	10000			



The SAS Solution for You

The SAS System runs on the corporate hardware you've already installed so there's no need to purchase additional equipment for all your new users. The SAS System runs on IBM 370/30xx/43xx and compatible machines under OS, VM/CMS, DOS/VSE, SSX, TSO, and ICCF. The SAS System

also runs on Digital Equipment Corporation's VAX™ 11/7xx series under VMS™ and Data General Corp.'s ECLIPSE® MV family under AQS/VS. And we are constantly researching and developing our software for new state of the art hardware.



“In short, the SAS System gives you everything you need—at a price you can afford.”

So put an end to the demands. Send the coupon or call us today for the solution to your Information Center needs.

SAS Institute Inc., SAS Circle, Box 8000, Cary, NC 27511-8000, USA. Telephone (919) 467-8000. Telex 802505.

Outside the US, call our subsidiaries in the United Kingdom, West Germany, France, New Zealand, Australia, and Singapore, or our distributors in Japan, Italy, Israel, South Africa, Brazil, Colombia, Singapore, and Saudi Arabia.

- ☐ I want to learn more. Send me The SAS Solution packet.
- ☐ Have a sales representative call me today!

Please complete this coupon or attach your business card.

Name _____
 Title _____
 Company _____
 Address _____
 City _____ State _____ ZIP _____
 Phone (____) _____
 Hardware _____
 Operating System _____

SAS

SAS Institute Inc.
 SAS Circle, Box 8000, Cary, NC 27511-8000

NEWS



**INTERNATIONAL
REPORT**
CW International
News Network

AUSTRALIA

SUMMER HILL — An expert system that provides quantitative measurement of the performance of software and systems will be the first project of an artificial intelligence research center to be established here next month.

The Productivity Research Center will be created by software consultant David Tow, with the backing of the Systems Research Institute of Australia in Perth. The system, called the Spacer 9 system, will re-

portedly provide audit and comparative evaluation and review.

BRAZIL

BRASILIA — Two policies on privacy are now under debate here in the Brazilian Congress. At issue is the recovery and use of information kept in a public data base. The latter proposal, seen as the more far-reaching of the two, is seeking to keep more information safe from potential government surveillance.

ITALY

ROME — IBM Europe President Kaspar Cassani told the European scientific press here recently that the company will award an IBM Europe

Prize for the best European scientist in 1985. He also announced the establishment of a scientific engineering center here to be made available, free of charge, to 15 European engineers.

JAPAN

TOKYO — IBM Japan Ltd. has recently begun full-scale production of 5¼-in. hard-disk drives for the IBM Personal Computer XT. The drives reportedly will be available in 10M-, 15M- and 20M-byte configurations.

TOKYO — Densan Co. Ltd. has unveiled its Idea 2000 microcomputer, which runs on Unix 4.1 and operates at speeds up to 20M bit/sec using a local bus, the vendor said. The system is being targeted at schools, laboratories and in distributed, office auto-

mation and computer-aided design environments. Densan also announced that it will begin exporting its products on a large scale to the U.S.

TOKYO — Fujitsu Ltd. has announced a 16-bit personal computer, the FM-16 Bata, for business use. The machine is based on the Motorola, Inc. 80186 microprocessor and the Japanese CP/M 96 Kanji operating system. It reportedly handles Kanji character processing.

TOKYO — Nippon Telegraph and Telephone (NTT) has unveiled its Captain videotex service. The system currently lists 310 information providers and 1,790 terminals in use.

ENGLAND

LONDON — The UK has gained a major presence in the Chinese computer market with the establishment of a \$50 million joint venture company to produce microcomputers in China. The UK consortium, headed by Rair Computer Corp., will reportedly provide the Chinese with the knowledge and equipment needed to establish their own micro industry.

LONDON — Embarrassing news greeted Control Data Corp. here with the revelation that the Russian PS 2000 supercomputer, recently sold to India, is based on CDC technology. The system was originally conceived as a Soviet-CDC joint project, but the U.S. government forced the American vendor to pull out of the project. The PS 2000, which is said to be in the 400 million to 600 million floating-point operations per second range, makes the USSR the third independent source of supercomputers in the world.

WEST GERMANY

MUNICH — IBM is being accused of selling its machines for low prices through the back door in order to undercut competitors here. At the same time, the German subsidiary of the Swedish lessor ICS is thought to be profiteering on IBM's 40% university discount policy by leasing discounted machines to German universities and reselling them to commercial users for full price.

Open up your world with DMS HiNet™ networked systems, the solution to your needs for communications, data storage and security, personal computing, and reliable backup. Where others provide only components, we provide everything — IBM-compatible workstations, interface cards for IBM PCs™ and compatibles, high-capacity hard disk storage, network and operating system software, and cabling.

Up to 63 users on each network can share data, programs, and peripherals. Multi-user applications thrive in the HiNet network environment. And HiNet-to-HiNet communications allow users all over the world to talk to each other inexpensively.

The enhanced DMS 816 PC-compatible workstation with high resolution graphics takes advantage of MS-DOS™, the wealth of PC-DOS™ software, and CP/M-86™ or CP/M-80™ programs. For special purpose graphics applications, such as Computer-Aided Design, the DMS 5000 series HiNet workstations provide computational speed and very high resolution at an incredibly low cost per user.

Digital Microsystems

If you already own IBM PCs or compatibles, connect them to HiNet with HiNet/PC Adapter cards. Conserve your investment while expanding the utility of your system.

Our new streamlined master server offers a wide range of hard disk capacity, plus flexible backup options. And the DMS MimicMaster™ brings no-fault computing to the network world by offering true redundant processing.

Some of the largest firms in the world utilize Digital Microsystems' HiNet networked systems for distributed data processing, micro-mainframe communications, and data security. They know they have the support of an international company, which is part of Eitel Group PLC.

If you'd like to enjoy the productivity that a networked system provides, call or write the people at Digital Microsystems today for information on HiNet. You'll net the world.



NEW LIFE FOR 1401 PROGRAMS

CS-TRAN converts your 1401 OBJECT programs to COBOL for the mainframe or mini of your choice.

CS-TRAN is the ONLY translator that accepts your OBJECT programs, patches and all, yet allows you to include actual COBOL paragraph names and record definitions.

If you'd like more details about new life for your 1401 programs just call or write:



C-S Computer Systems Inc.
200 South Main Street, P.O. Box 356
Manville, NJ 08835 • 201-528-9000

The Right Information at the Right Time...at No Charge to You!

The MIS Dilemma

Today's data processing professionals are asked to turn equal attention to the detail of day-to-day operations, as well as continually viewing new and critical industry issues. They are asked to be, at the same time, practiced technicians, inspiring managers, and masters of all that's new and current. They are expected to keep top management informed of the big picture, yet pay particular attention to the smaller issues and dilemmas they face each day within their departments.

Comdisco believes this is a near impossible task.

The "COMLINE" Solution

Comdisco's Professional Information Resource Team is loaded with valuable experience and knowledge that you need in today's changing times. To help you meet these challenges, we have launched an ongoing program of concisely-formatted reports, featuring issues we feel will most impact your company, your data center, and yourself.



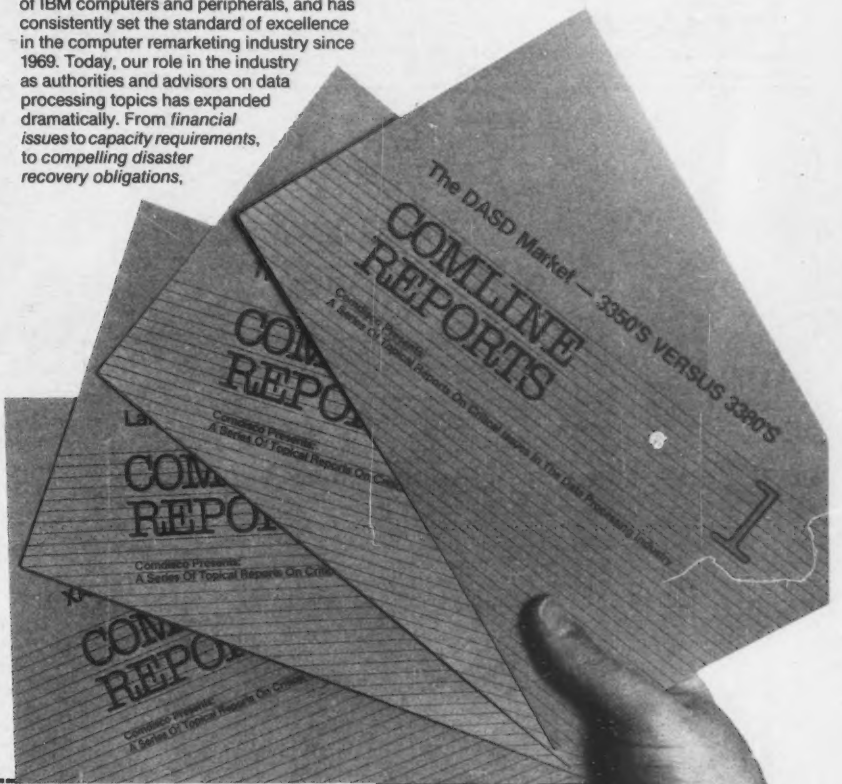
Comdisco, Inc.
6400 Shafer Court
Rosemont, Illinois 60018
312/698-3000

The new series, entitled *Comline Reports*, is a means through which industry professionals can take advantage of the experience and information which flows daily within our technical, financial and marketing channels.

Why Comdisco?

Comdisco is the world's largest remarketer of IBM computers and peripherals, and has consistently set the standard of excellence in the computer remarketing industry since 1969. Today, our role in the industry as authorities and advisors on data processing topics has expanded dramatically. From *financial issues to capacity requirements, to compelling disaster recovery obligations*,

Comdisco professionals are making the effort to keep you informed of the issues. To thousands of Comdisco customers, our name and our standard of quality service is second nature. To those of you who would like to learn more about the expanding scope of our services, as well as subscribe to our *Comline Reports*, we invite you to clip the coupon below.



Order Your *Comline Reports* Today! (Limited Offer) The current offering of *Comline Reports* is specified below. Simply indicate the reports you wish to receive, and mail us the coupon today!

Current Issues:

- ☐ Large Mainframe Update: The Used 3080 Market
How to take advantage of lower cost, used 3080's until IBM's new systems are delivered.
- ☐ XA Migration: The Hardware Solution
The "path of least resistance"... But is it for you?
- ☐ The DASD Market: 3350's versus 3380's
New technology is not a good enough reason for choosing 3380's. A combination of 3350/3380 may work best!
- ☐ Core Recovery: The Prelude To A Disaster Recovery Program
The sensible way to get a Disaster Recovery Program in motion.

- ☐ Customer Visits/Videotape Program
What they are... and how to take advantage of them.

Future Issues:

- ☐ Comdisco Lease Line
A convenient leasing program for any and all equipment... from PC's to PBX's—designed especially for high-volume/multiple-location requirements.
- ☐ IBM's Long Range Planning
How new and future technology can affect your hardware decisions today!
- ☐ Choosing A Leasing Company
The pitfalls, and how to avoid them; a brief history of leasing; and an analysis of ICC.

- ☐ Data Center Relocations
How Comdisco can duplicate an entire data center, regardless of the size.
- ☐ Communications
Where are we headed? What can Comdisco do to help?
- ☐ The 4300 Marketplace
Where to go from a 4341? How long will your 4381 last?
- ☐ Financial Analyses
Read about Comdisco's package called FACTS, the only financial analysis package that intelligently deals with choosing hardware.

Name _____ Title _____
Company _____ Phone _____
Street _____ City _____ State _____ Zip _____

Mail to: Comdisco, Inc., 6400 Shafer Court, Rosemont, IL 60018 312/698-3000

PROTOCOL CONVERSION

Expand your 3270 network with low cost ASCII devices!

Now you can integrate personal computers and low cost ASCII devices directly into your IBM 3270 network. With our protocol converters you can add on low cost ASCII peripherals either by using Type A coax attachment or by 3274/3276 controller emulation. Innovative delivers flexibility, simplicity and competitive prices with our family of 3270 products.

Call us today toll free (800-327-3955), and find out how you can expand your 3270 network easily and inexpensively. Prices starting at just \$895.

COAXIAL CONNECTION

- IBM 3270 Type A Coax plug-in card for IBM PC or XT
- IBM 3270 Type A Coax to ASCII Printers
- IBM 3270 Type A Coax to ASCII CRT/Host

3274/76 EMULATION

- IBM 3270 SNA/BSC to (5-24) ASCII Devices
- IBM 3270 BSC to Burroughs/NCR Devices
- IBM 3270 BSC to ASCII Devices/Host (low cost - 3 ports)
- IBM 3270 SNA to NCR/Burroughs Devices

*Custom protocols available - Call to discuss your special application.

Innovative

INNOVATIVE ELECTRONICS, INC. • 4714 NW 165 St., Miami, FL 33014

(305) 624-1644

NEWS

Computer-related training available for handicapped

By Donna Raimondi
CW Staff

STAMFORD, Conn. — Thirty of the top Fortune 500 companies are giving gifts of money, time and hope here to a group of handicapped people.

The companies are funding a program run by the Biped Corp. that trains handicapped workers to become computer programmers, according to Kathy Jarvie, instructor/coordinator at Biped. The one-year school, which is free of charge to enrollees, teaches Cobol, Basic, JCL and dump analysis to the physically

handicapped and offers classes in additional subjects such as microcomputers and data bases, according to Jarvie.

The school's graduates have found jobs in a variety of businesses, she noted, and it usually costs the hiring business nothing for special equipment or accommodations.

At present, GTE Telenet Communications Corp. and Union Carbide Corp. contribute \$70,000 to \$80,000 worth of computer time each year, Jarvie said, and companies, including American Can Co., Xerox Corp., Reader's Digest Association, Inc., Texaco, Inc., IBM and Perkin-Elmer Corp. donate money, equipment, office supplies and anything else the school needs to do its job.

Representatives from donor companies sit on all school committees and advise the school staff on what job skills are in demand, Jarvie said, helping it to fulfill realistic business community needs.

Industry provides a better program

The program was started in 1980 by Joseph LaMain, Jarvie said. "LaMain was a programmer/analyst at the time, and he worked for the Easter Seal rehabilitation center in New Haven, Conn. He thought that industry would provide a better program, with less red tape, than any government agency could," she said.

The program now operates centers in White Plains, N. Y. and Stamford, Conn., Jarvie said. Twelve students are accepted into each program from the more than 200 who apply at each location. Each program has two teachers, she said.

The program accepts students with almost any handicap, including blind, deaf and quadriplegic people, Jarvie said, but it is not easy to get accepted. Jarvie administers IQ tests to all applicants, looks over medical reports and high school or college records. The student then sits with a psychologist for four hours and performs a number of computer aptitude and reading comprehension tests, she said.

The classes comprise a variety of age groups and education levels, Jarvie said. This year, two of the students she taught had master's degrees and two were straight out of high school, she said.

In addition to course work, the students are taught business etiquette, dressing for success and a variety of business related skills.

"We run the program like a company," Jarvie said. "We teach the students about status reports, presentation arts and other skills that the corporations tell us the students need to be ready for employment." The instructors hold students responsible for reporting equipment problems to vendors and seeing to it that repairs are made, she noted. "They basically run the company with my guidance," she added.

After completing the course, the new programmer receives a certificate and goes through a committee — made up of members of the sponsoring companies — for placement.

More information is available from Biped, 26 Palmers Hill Road, Stamford, Conn. 06902.

C Compilers



For over six years we have been supplying the leading developers of technical and scientific applications with innovative systems software

Whitesmiths, Ltd.

97 Lowell Road

Concord, MA 01742

(617) 369-8499

IBM® Software Notes

News for the DP professional



BancOhio is constantly improving its products and services, with help from IBM's DB2.

Managers at BancOhio Are Banking on DB2

"DATABASE 2 (DB2) is an efficient vehicle for providing our top management with financial and analytic details," says Jack Kiger, Vice President and Director of Data Processing at BancOhio in Columbus, Ohio.

The bank, which has more than 250 branches throughout the state, has been testing DB2, IBM's full-function relational data base system, for a year and a half. "In that time, we did a 22 man-year MIS project in only 24 man-months," reports Kiger.

The key to this outstanding productivity is DB2's powerful Structured Query Language (SQL), which makes corporate data available—simply, economically and with full data security and control.

Through its Query Management Facility (QMF), DB2 pro-

vides end users with a friendly interface to SQL, including a full set of helps and prompts. Users can query the data base directly, ask the system to generate reports or create their own unplanned reports.

But DB2 is much more than an end-user product.

It's a full-function relational system that lets professional programmers develop complex applications with greatly improved productivity. It provides them with the facilities they need for backup, recovery, restart and security. These functions can be incorporated in an application by simple statements and need little explicit programming.

With these security provisions, transactions are well protected. This means that DB2 can handle online applications

while maintaining the integrity of the corporate data resource. Thus DB2 can meet the full range of needs: production work as well as end-user query and reporting services.

"Our experience with DB2 has been beneficial," Kiger adds. "From the standpoint of stability and ease of use, it's the best product IBM has delivered to us." ■

A NOTE TO THE READER

To keep you informed of software developments at IBM, we will publish *Software Notes* on a regular basis.

Software Notes will bring you news of programs that help make systems and people more productive. It will feature articles on high-productivity packages such as DB2, IBM's full-function relational data base system, and application development tools such as the Cross System Product Set. And it will tell you about users' experiences with IBM software.

We'll also let you know about new software courses and other IBM offerings that can help you get the most from your DP resources.

More *Software Notes* appear on the next page.

IBM Software Notes



Evaluator (rear) works with a piece of IBM software. Observers note her efforts and record them.

'Usability' Labs Help Make IBM Software Easy to Use

It's one thing to create software that works. It can be quite another to make that software easy for users to learn and operate, and to support it with documentation that's easy to follow.

Dr. Lewis Branscomb, IBM's chief scientist, puts it this way: "It shouldn't be necessary to read a 300-page book of instructions before using a computer, any more than it is before driving a new automobile."

That's why, prior to release, IBM evaluates many pieces of software for "usability." We've taken a scientific approach to this process in Usability Laboratories located in cities across the United States.

The evaluators are people who have not had software experience.

In each lab, we've set up a complete office environment, attractively decorated and comfortably furnished. On each desk is an IBM workstation which supports the software to be evaluated.

Here, evaluators at the workstations are handed the instruction manuals and assigned the task of putting a piece of software through its paces. As each evaluator works, he or she is observed and recorded. Every interaction on the workstation screen is recorded too.

Through this feedback we've learned a lot about our software—and our documentation. We've also made software, such as the IBM Business Management Series, a lot simpler to use. ■

IBM Offers Courses on IS Management

If you're interested in learning about management issues related to information systems, or in getting advice on training, or in just keeping current yourself, you'll be interested in the offerings of IBM's Information Systems Management Institute.

The institute offers over 38 courses in six information systems areas: Information Systems Planning, Applications Development, Service Management, Information Asset Pro-

tection, End User and Personal Computing, and Personal Development and Management.

The courses seek to help users increase their productivity in data processing. Lasting from two to five days, the courses are offered in over 25 cities and are taught by staff instructors who combine years of teaching with practical knowledge.

To order a free catalog of courses, just return the coupon at right. ■

The Cross System Product Set Aids Programmers at Corning

Through an innovation in application development, Corning Glass Works, Corning, New York, has eliminated most of the detail work involved in conventional programming.

The innovation is the Cross System Product Set from IBM.

With this program, a developer can complete every phase of a project interactively at a terminal. This includes defining and validating screens, files and logic; testing and debugging a program; running trial executions and putting the application into production.

The Cross System Product Set is especially effective as a development facility for applications designed to run under CICS, or in distributed 4300 and 8100 systems.

According to Steve Grace, Supervisor of Application Development Technology at Corning, "The program's in-

teractive nature and extensive debugging aids lend themselves to developing applications quickly and accurately."

What's more, the Cross System Product Set requires fewer special CICS skills on the part of the programmer. Such features as trial screens and quick prototype executions improve communication between DP personnel and end users.

The program runs on all 4300 and 30XX series operating systems and on the IBM 8100 with DPPX/System Program. It's portable, so that an application developed on one supported system can be run on another.

Mr. Grace sums up Corning's experience with the Cross System Product Set like this: "As a result of its many benefits, we've been able to satisfy user requirements faster and more economically." ■

RACF Helps Protect Data At United Student Aid Funds

"We are pleased with the enhancements of the IBM Resource Access Control Facility (RACF)," says Dan Roddy, Manager of Data Center Support for United Student Aid Funds, Indianapolis, a nonprofit corporation which guarantees and services student loans.

"In particular, a new system of resource definition in RACF, called 'generic profile checking,' makes administration much simpler. Most data sets can be protected using only the first-level qualifier," Roddy adds.

Profile checking is just one of the many features that make RACF easy to implement and maintain. Flexibility of design and structure is another. In addition, with RACF you need not modify your operating system or system-level software such as CICS, IMS, DB2 or HSM.

RACF uses list orientation, a simple technique for access control. With little effort, you can establish ownership and control over your resources. You can also designate who else may have access—and how much access.

RACF has features which make it easy to demonstrate that the controls have worked.

Positive control, excellent security, simple maintenance and administration: These are the benefits that make RACF a widely accepted access control product. And RACF is designed to work closely with such IBM operating systems as MVS and MVS/XA. ■

IBM	12-17
DRM	
Dept. 3X/90	
400 Parson's Pond Drive	
Franklin Lakes, NJ 07417	
Please send me literature on:	
<input type="checkbox"/> DB2	<input type="checkbox"/> RACF
<input type="checkbox"/> Cross System Product Set	
<input type="checkbox"/> Information Systems Management Institute	
Name _____	
Title _____	
Company _____	
Address _____	
City _____	
State _____	Zip _____
Phone _____	

IBM®

NEWS

System used in protest

Students stage futile attempt to crash computer

By Donna Raimondi
CW Staff

OVERLIN, Ohio — Student activists here tried but failed to overload the campus computer system to bring attention to their demands that Oberlin College divest itself of stock in South African companies.

In response to an open plenary session of the school's board of trustees in the Mudd Learning Center — where the library and computer center are housed — a splinter group of the Student Coalition Against Apartheid decided to bring down the computers in protest of the stock holdings, said John Harvith of the school's public relations office.

"The student organization got together to determine how to protest, and the organization as a whole decided not to use computers to do it," Harvith said, but four to six students did it anyway.

"They were not sophisticated about it," said Kevin Weidenbaum, director of academic support services at the college. "It's possible that if a consultant had not come in and told me what was happening, we wouldn't even have noticed," he said.

The protesters decided to run programs that would grind on the system, Weidenbaum said, and several students sat at terminals with an old Basic assignment — a long iteration process to find sets of integers in a given equation, he said. Others did "even sillier things" he added, like setting up loops to keep the printers spewing out garbage printouts.

At the peak of the protest, the computer was running an average load, Weidenbaum said. "These are not hackers with novel and interest-

ing ways to crash the computer," he added. Some of the student protesters had never used their accounts before, and the students did not really know what they were doing, he said.

The target computer was a 10-year-old Xerox Corp. Sigma 9 that is not used much anymore, Weidenbaum said. Students also tried to bog down the college library's automatic circulation system by checking out and returning huge numbers of books — another play that failed, he said.

"We deactivated a couple of student accounts because of it," he said, but no further disciplinary action will be taken.

Apple Macintosh subject of meet

WESTWOOD, Mass. — Apple Computer, Inc.'s Macintosh microcomputer will be the focus of discussion at the Feb. 21-23 Macworld Exposition at Brooks Hall in San Francisco.

Sponsored by *Macworld* magazine, the exposition reportedly will include product exhibits and conference sessions as well as a software clinic.

Cost of admission to the three-day show is \$15 for exhibits only, \$30 for exhibits and conference. Charge for students is \$5 for exhibits only, \$15 for conference and exhibits.

More information can be obtained from Mitch Hall Associates, P.O. Box 860, Westwood, Mass. 02090.



"Do you remember the good old days ... and the Christmas parties?"

AVOID DOWNTIME!

WATER ALERT®

... FOR COMPUTER AREAS

Warns you of water leakage in sub-floor wiring areas.

- Produces a loud, intermittent alarm when activated by presence of water.
- Completely self-contained ... no wiring, no connections.
- Early water detection (1/64" water film activates alarm) provides maximum time for corrective action.
- 24 hour per day monitoring.
- Options include remote indicator, remote flashing light, and automatic telephone dialer.

8 Models from \$59 - \$110

Call or write for complete information.

Dorlen Products

Division of Electro Consultants, Inc.
7424 W. Layton Ave. Milwaukee, WI 53220
Phone 414-282-4540

An Executive Seminar for Suppliers of Computers and Software

January 17-18, 1985 Rancho Bernardo
San Diego

February 14-15, 1985 Miami Lakes Inn & Country Club
Miami Lakes

DEVELOPING A UNIX MARKET STRATEGY

THE UNIX MARKET—TODAY AND TOMORROW

- Size and breakdown of market
- Alternatives to UNIX
- Applications software
- Market position and strategy of: IBM • AT&T • Others

ALTERNATIVE STRATEGIES FOR APPROACHING THE MARKET

- Marketing strategies and implications
- Product strategies and implications
- Timing considerations

PRACTICAL IMPLEMENTATION OF YOUR UNIX STRATEGY

- Marketing issues
- Product development decisions
- Support and maintenance
- Training
- Financial considerations
- Suggested next steps

SEMINAR LEADERS

Thomas F. Cull, international UNIX marketing expert and consultant who served as president of Interactive Systems Corporation during their development of PC/IX and VM/IX for IBM.

Joseph G. DiGiacomo, vice president-UNIX Product Development for the Computer Technology Group and former manager of UNIX education for AT&T.

FOR FURTHER INFORMATION
CALL: (800) 323-UNIX or
(312) 987-4082

Presented by

**COMPUTER
TECHNOLOGY
GROUP**
Telemedia, Inc.

The Leading Independent UNIX Training Company • 310 S. Michigan Avenue • Chicago, IL 60604

Technology
To balance this brochure provides a more detailed overview of our five integrated software technologies. Look closely at what Cincom Systems has to offer. We believe that our new product line covers every product either begun or completed in the 1980's provides the highest degree of reliability, integrity and performance in the industry.

When you see for yourself the new Cincom Systems is not, you'll understand why the "Excellence In Software Technology" fit so well under our

reasons why we're ndor you'll ever need.

with our relational data management technology. A complete closed-loop system, MRPS is improving the productivity and profitability of over 125 IBM and DEC VAX manufacturing environments around the world.

#4 Financial Control Software

CONTROL: Financial is our sophisticated financial accounting and control system which molds to the way you do business. Integrated directly with MRPS, CONTROL: Financial includes Accounts Receivable and Credit Management systems with Accounts Payable soon to follow.

#5 Advanced Network Management

NET/MASTER™ is one of the most recent additions to the TIS family of integrated products. Very simply, NET/MASTER is an advanced network management system that takes the complexity out of managing a sophisticated IBM computer network and lays the groundwork for distributed data base processing.

#6 The Interactive Mainframe—Micro Link

Further expanding the capabilities of our software information network is PC CONTACT™, our mainframe-micro link which enables users to interactively upload/download data between the mainframe and IBM PC's. PC CONTACT gives the PC user the ability to

access multiple file types stored in the corporate data base for Decision Support manipulation.

#7 Micro Decision Support Software

For comprehensive micro-level Decision Support we offer SeriesOnePlus™*. SeriesOnePlus includes file management, spreadsheet, graphics, reporting and word processing components that are all integrated through a unique "BUS" architecture. Because the system is designed exclusively for business situations, SeriesOnePlus complements any mainframe-micro network strategy.

#8 Mainframe Decision Support Software

The recently introduced MANAGE USER SERIES™ provides powerful Decision Support capabilities for the mainframe user. The MANAGE USER SERIES combines graphics, text processing and application development tools to enhance the use and display of corporate data.

#9 Client Support

The one thing that isn't new about Cincom is our unrivaled commitment to service, support and user education. When you choose Cincom you can be assured of the highest caliber of support.

#10 Software Excellence

Why the New Cincom? Well, we like to think of ourselves as the New Cincom because every product in our TIS family of

integrated technologies has been released since 1981. And, quite frankly, we believe TIS provides the highest degree of reliability, integration, performance and value in the industry.

But don't take our word for it. We invite you to personally compare TIS with what our competitors are offering. Then you'll understand why the words "Excellence In Software Technology" fit so well under our name.




To Learn Even More About the TIS Family of Integrated Products, Call Or Write For Our Brochure: "THE NEW CINCOM: WHAT EVERY INFORMED SOFTWARE BUYER SHOULD KNOW!"

Cincom Systems Inc.
2300 Montana Avenue
Cincinnati, Ohio 45211
Attention: Marketing Services Department

1-800-543-3010
In Ohio: 513-661-6000
In Canada: 416-279-4220

Name _____
Title _____
Company _____
Address _____
City _____ State _____
Zip _____ Phone _____

 **Cincom Systems**
Excellence in software technology

CW 12/17

*SeriesOnePlus is a trademark of Execucom Corp.

NEWS



OFF THE PRESS
George Harrar

BOOK REVIEWS

LOCAL-AREA NETWORKS IN LARGE ORGANIZATIONS

By Thomas Madron

The author's premise is simply stated: It costs a large organization more not to install a state-of-the-art local-area network than it does to build one — in the long run, of course.

Madron is in favor of the broadband approach, based on his experience as manager of Computer Services at North Texas State University. Nearly seven miles of trunk line, 3,000 outlets and several hundred nodes cover the campus in a broadband network that is still evolving.

The "manager's briefing" subtitle aptly reflects the book's purpose of bringing readers up-to-date on the issues without overwhelming them with detail.

Technical terms are defined, but Madron clearly regrets the kind of network debate based on technical comparisons of systems. The relevant question is not what networking scheme is better technically; the manager should ask himself, "What problems do I need to solve?"

Paperback, 150 pages, \$16.95, ISBN 0-8104-6205-2. Hayden Book

Co., 10 Mulholland Drive, Hasbrouck Heights, N.J. 07604.

ALAN TURING: THE ENIGMA

By Alan Hodges

No one in the computer industry really needs to know 587 pages worth of Alan Turing's life. Much of this biography, in fact, you don't even want to know — his until-now secret affairs with schoolmates and his predictably awkward passage through public school in England, for instance.

Turing the mathematician helped crack Germany's World War II code. Turing the designer devised the Automatic Computing Engine ("with a memory capacity of a minnow") at the time the Electronic Numerical Integrator and Calculator was taking shape in the U.S.

Decades ago, he debated the virtues of infallibility and intelligence as machine attributes. He wrote: "It is easy for us to regard [a human mathematician's] blunders as not counting and give him another chance, but the machine would probably be allowed no mercy. In other words then, if a machine is expected to be infallible, it cannot also be intelligent."

Could even an intelligent machine produce a sonnet the equal of Shakespeare's? Turing answered in 1949 that this question was "perhaps a little bit unfair because a sonnet written by a machine [would] be better appreciated by another machine."

After arrest for his sexual relationships, Turing submitted to hor-

mone therapy. A year later, June 7, 1954, he poisoned himself.

Author Andrew Hodges laboriously researched one of the most intriguing minds in computer history and apparently felt compelled to write down everything he found. The result is that Turing loses the mystery that first draws you to him. He is no longer an enigma.

Paperback, 587 pages, \$10.95, ISBN 0-671-52809-2. Touchstone Books, Simon & Schuster, 1230 Avenue of the Americas, New York, N.Y. 10020.

DIAGRAMMING TECHNIQUES FOR ANALYSTS AND PROGRAMMERS

By James Martin
and Carma McClure

Another James Martin book, you ask? This one, with writing sidekick McClure, calls on the DP executive to prepare for the coming revolution — computer-aided systems analysis and computer-aided programming. It is a revolution that goes beyond structured programming: A computer will generate code from the systems design that the designer creates on his graphics screen.

Martin and McClure take analysts, programmers and their managers on a walk through conventional diagramming — a kind of refresher course. The authors picture Warnier-Orr and Michael Jackson diagrams, flowcharts, structure charts and much more in great detail.

This book is less an argument for one point of view than an explana-

tion of many views on diagramming.

Hardcover, 396 pages, \$40, ISBN 0-13-208794-4. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

BOOKS OF NOTE

THE COMPUTER CRIME LAW REPORTER, a compilation of laws in effect in 33 states, edited by Jay BloomBecker. Paperback, 200 pages, \$45. National Center for Computer Crime Data, 4053 JFK Library, California State University-Los Angeles, 5151 State University Drive, Los Angeles, Calif. 90032.

ARTIFICIAL INTELLIGENCE & ROBOTICS: FIVE OVERVIEWS, covering AI, robotics, expert systems, vision and natural language processing. Hardcover, 643 pages, \$103.50. Business/Technology Books, P.O. Box 574, 14 Evergreen Drive, Orinda, Calif. 94563.

THE SOFTWARE HANDBOOK, a guide to techniques and methodologies used in project management, systems analysis, programming, testing, documentation and quality assurance, by Dimitris Chorafas. Hardcover, 461 pages, \$49.95, ISBN 089433-248-1. Petrocelli Books, Inc., 1101 State Road, Princeton, N.J. 08540.

Publishers wishing to have their books considered for review can direct books, prepublication galley, press releases, catalogs or other information to George Harrar, Book Review Editor, Computerworld, P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.



"The boss left his usual Christmas message."

This announcement appears as a matter of record only.

\$5,000,000

WALKER INTERACTIVE PRODUCTS

Convertible Preferred Stock, Series 1984

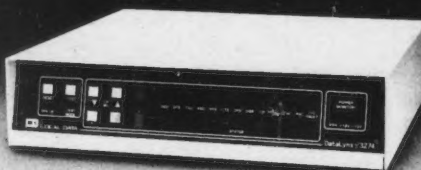
These securities were placed privately.

**ROBERTSON
COLMAN &
STEPHENS**

SAN FRANCISCO BOSTON NEW YORK LONDON

July 1984

You deserve the best
link to IBM...
DataLynx™ /3274



For several years Local Data has provided AT&T Information Systems, Avis, Bell Labs, Citicorp, Exxon, General Motors, IBM, ITT and other Fortune 500 companies with easy and inexpensive IBM communications using DataLynx™ /3274... the best price/performance 3270 protocol converter available.

Supporting over 50 primary types of terminals and satisfying requirements of more than 125 varieties of ASCII terminals and PC's, DataLynx™ /3274 offers base color support for IBM PC and Viewpoint/78 color terminals, interleaved display/

print data over a single dialup connection, pseudo-transparency, graphics data passthru, command port facility, disable echo on ASCII CRT port for computer or X.25, 3270 BSC to 3270 or 5251 SNA field upgradeability and many more additional features than any other 3270 protocol converter.

Call (213) 320-7126 for more information and ask about our free 30-day trial program. In Canada call (613) 748-9751.

"Your Lynx to IBM"

**LOCAL
DATA**

2271 TOLEDO STREET, TORRANCE, CA 90503 TLX 182518

The New Cincom: Find out more about TIS™ at one of our free seminars.

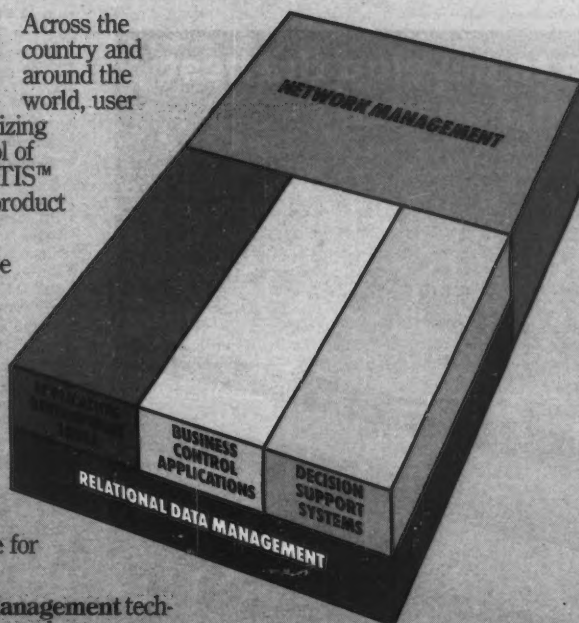
TIS

Across the country and around the world, user

organizations are realizing unprecedented control of information with the TIS™ family of integrated product technologies.

Very soon we'll be holding a free TIS Seminar in your area to illustrate how the application development and information control technologies of TIS have been designed to model the way you do business. We want you to attend and see for yourself how our:

- **Relational Data Management** technology is designed for end-user interaction with high performance.
- **Application Development Tools** meet the three most important criteria of 4th Generation technology: end-user prototyping, a full function development language, and high performance in a production environment.
- **Business Control Applications** solve manufacturing and finance's toughest business problems through our advanced technology and implementation experience.
- **Decision Support Systems**, for both mainframe and micro environments, can make every level of management more productive.



- **Network Management** software allows you to reduce costs and improve the performance of your information network efforts, from distributed data base management to distributed processing.

But most importantly, we want you to see how all of these technologies come together to form TIS. Because once you've seen TIS in action, then you'll understand why we're the only software vendor you'll ever need.

Call today for seminar reservations and we'll rush you a copy of "THE NEW CINCOM: WHAT EVERY INFORMED SOFTWARE BUYER SHOULD KNOW."



**Cincom
Systems**

Excellence in software technology.

TIS Seminar Schedule

In the U.S. call 1-800-543-3010
In Ohio call 513-661-6000

Albany, New York	February 21, 1985
Albuquerque, New Mexico	March 19, 1985
Atlanta, Georgia	February 14, 1985
Baltimore, Maryland	January 29, 1985
Birmingham, Alabama	January 17, 1985
Boston, Massachusetts	February 6, 1985
Charlotte, North Carolina	January 31, 1985
Chicago, Illinois	January 31, 1985
Cincinnati, Ohio	February 19, 1985
Cleveland, Ohio	January 29, 1985
Columbia, South Carolina	March 26, 1985
Columbus, Ohio	March 7, 1985
Dallas, Texas	January 15, 1985
Dallas, Texas	January 22, 1985
Dallas, Texas	February 12, 1985
Denver, Colorado	February 19, 1985
Detroit, Michigan	January 16, 1985
Fort Wayne, Indiana	February 6, 1985
Grand Rapids, Michigan	March 13, 1985
Greensboro, North Carolina	March 5, 1985
Greenville, South Carolina	January 29, 1985
Hartford, Connecticut	January 30, 1985
Houston, Texas	January 17, 1985
Houston, Texas	February 5, 1985
Houston, Texas	February 19, 1985
Huntsville, Alabama	February 21, 1985
Indianapolis, Indiana	March 14, 1985
Jackson, Mississippi	February 26, 1985
Kansas City, Kansas	March 26, 1985
Louisville, Kentucky	March 21, 1985
Memphis, Tennessee	February 28, 1985
Miami, Florida	March 14, 1985
Milwaukee, Wisconsin	February 20, 1985
Minneapolis, Minnesota	February 27, 1985
Minneapolis, Minnesota	April 17, 1985
Mobile, Alabama	February 5, 1985
Nashua, New Hampshire	January 31, 1985
Nashville, Tennessee	February 19, 1985
New Haven, Connecticut	January 24, 1985
New York, New York	March 6, 1985
Oakbrook, Illinois	March 6, 1985
Orlando, Florida	February 7, 1985
Pittsburgh, Pennsylvania	February 7, 1985
Portland, Maine	January 22, 1985
Providence, Rhode Island	February 5, 1985
Raleigh, North Carolina	March 28, 1985
Richmond, Virginia	May 8, 1985
Rochester, New York	February 28, 1985
Rye, New York	February 14, 1985
Salt Lake City, Utah	February 21, 1985
San Francisco, California	February 21, 1985
Schaumburg, Illinois	February 13, 1985
Seattle, Washington	February 26, 1985
St. Louis, Missouri	March 28, 1985
Stamford, Connecticut	February 13, 1985
Syracuse, New York	February 27, 1985
Tampa, Florida	March 12, 1985
Tarrytown, New York	March 13, 1985
Teaneck, New Jersey	February 27, 1985
Washington, D.C.	February 11, 1985
Washington, D.C.	April 8, 1985
Washington, D.C.	June 10, 1985
Washington, D.C.	June 27, 1985
Worcester, Massachusetts	January 29, 1985

In Canada call 416-279-4220

Ottawa, ON	February 13, 1985
Ottawa, ON	April 17, 1985
Toronto, ON	January 15, 1985
Toronto, ON	March 13, 1985
Toronto, ON	May 15, 1985
Montreal, PQ	January 17, 1985
Montreal, PQ	January 31, 1985
Montreal, PQ	February 14, 1985
Montreal, PQ	March 14, 1985
Montreal, PQ	April 18, 1985
Montreal, PQ	May 16, 1985
Montreal, PQ	June 13, 1985
Calgary, AB	March 7, 1985
Calgary, AB	May 2, 1985
Edmonton, AB	March 14, 1985
Edmonton, AB	May 9, 1985
Vancouver, BC	March 28, 1985
Vancouver, BC	May 23, 1985
Winnipeg, MB	March 21, 1985
Winnipeg, MB	May 16, 1985

WHY OUR CONTRACT PROFESSIONALS HAVE BETTER JOBS.

u n i x

UNIX is a trademark of Bell Labs.

An equal opportunity employer.

Our UNIX® specialists select from a variety of fascinating short-term and long-term projects. They spend their professional time profitably, working on leading-edge assignments for firms that appreciate their expertise.

If you are a UNIX specialist, call us. (617) 449-6685.

We locate quality contract positions for you—locally or anywhere nationwide. And we handle every detail, so you can devote yourself to professional growth and success.

Show us that you're good, and we'll take care of the rest.

MICRO/TEMPS—the leader in contract software professionals for UNIX and other specialties.



79 Crawford Street, Needham, MA 02494 (617) 449-6685

Greenbelt, MD. (301) 474-9063
Baltimore, MD. (301) 652-1009
Los Angeles, CA. (818) 506-3261

San Francisco, CA. (415) 952-5010
Santa Clara, CA. (408) 554-0161
Orange County, CA. (714) 731-6650

Pie shop deserts old system for speech board accounting

LONG BEACH, Calif. — A restaurant chain is saving up to \$5,000 in service bureau fees by using microcomputers with speech boards to process daily sales and bank deposit reports from its restaurants.

Marie Callender Pie Shops, Inc. based here, had been receiving its daily reports for several years from Automatic Data Processing, Inc. (ADP) on a contract through Crocker Bank. That service required the restaurant accountants in the field to read their daily reports over the telephone to ADP operators, who keyed the data into ADP's system for daily

downloading to a printer at the Marie Callender headquarters. There, the data was keyed into Marie Callender's Texas Instruments, Inc. 990/12 Model 30 minicomputer.

The chain wanted a new system and stumbled upon it when the minicomputer was being serviced.

"I got onto the idea when a TI serviceman was servicing the mini, and I noticed that he was calling Texas and punching numbers into the phone. It looked like he was communicating with a computer. He was using the phone to order parts. I thought we [could] use something like that here," said Frits W. Van Oppen, an internal consultant for Marie Callender.

Marie Callender purchased two TI Professional Computers equipped with TI's Speech Command Hardware Kit and TI's Speech Command System. Including the cost of off-the-shelf software, a memory expansion card and developing an application to handle the report accounting, the company spent \$20,000 for the systems. Van Oppen said that cost should be recovered in January or February as the company saves the \$4,500 to \$5,000 it was paying to ADP.

The micros were installed in September, and the 58 company-owned restaurants and coffee shops were added to the reporting network in phases through mid-October.

Today, each restaurant makes daily reports that take from one to two minutes.

Touch-Tone preferred

Callers now familiar with the procedure prefer Touch-Tone input to the micros over talking to a service bureau operator using a CRT, Van Oppen said. Because it uses voice playback for verification, the micro is slower than the CRT operator, who verifies no data. The program that Marie Callender's staff wrote makes several tests of the data and will not accept the result if the entry is unbalanced.

"One of the big improvements over ADP is the editing capability. ADP didn't do any editing, which means making sure that the data is valid and that the details for the deposits agree with the total of the deposits. If they didn't agree before, ADP would throw them into the edit column. The [personal computer] forces the caller to resolve the problem before the call is terminated," Van Oppen said.

He added that the only expense for the remote restaurants is the cost of a telephone call. When making a report, a caller uses a standard Touch-Tone telephone to punch in details such as the restaurant identification number, the previous day's sales, the number of bank deposits and the number of credit card sales. The caller responds to voice prompts recorded by headquarters office manager when the system went on-line.

Van Oppen noted that the company appreciates the savings and the data integrity and that office personnel are happy with the system because it eliminates the need to key data into the minicomputer. "There's no cost at all at the store end, and it's much cleaner on our end," he said.

It took us five years to develop the best DOS/VS(E) disk/tape manager.

It will take you
ten minutes
to prove it.

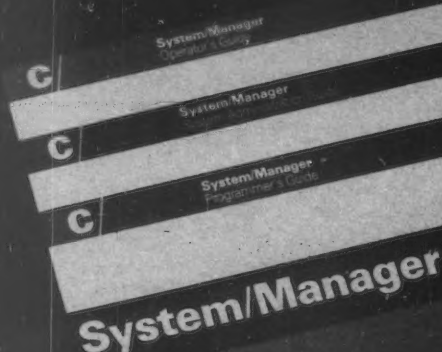
That's all the time needed to have our System Manager demonstration tape up and running.

And saving you money.

For a no-obligation, thirty-day trial, simply call
617-426-8780.

Or write us:
Corodale Incorporated
133 Federal Street
Boston, Massachusetts
02110.

Telex 710-3216747



Never Again Choose Between Price and Quality.

The competition says you must sacrifice one for the other. What they're really saying is they can't give you both. Introducing the TeleVideo® 921. Proof that low price and high quality do go together.

But don't let its low price fool you. The 921 is years ahead with features taken from our most expensive terminals. Like selectable embedded or nonembedded field attributes. 32 nonvolatile function keys. 6 fast edit keys. And something we're famous for: in depth support. Including technical assistance, service training and award winning documentation.

One glance at its nonglare amber or green screen with true tilt and swivel. One pass over its low profile, sculptured keyboard. And you know this terminal is built right. In fact, the 921 is built to the highest quality standards in the industry—our own. We use modular subassemblies. All components are pretested and pre-stressed. Boards are mounted vertically to run cooler, last longer. There's even room to plug in upgrade options. Like our low cost, Tektronix® compatible graphics board.

The point is this. Don't sacrifice either price or quality. Get both. Get the new TeleVideo 921.

Call toll free, (800) 538-8725. In California, call (408) 745-7760.

Regional Sales Offices: California/Santa Ana (714) 476-0244, California/Sunnyvale (408) 745-7760, Georgia/Atlanta (404) 447-1231, Illinois/Chicago (312) 397-5400, Massachusetts/Boston (617) 890-3282, New York/New York (516) 496-4777, Texas/Dallas (214) 258-6776

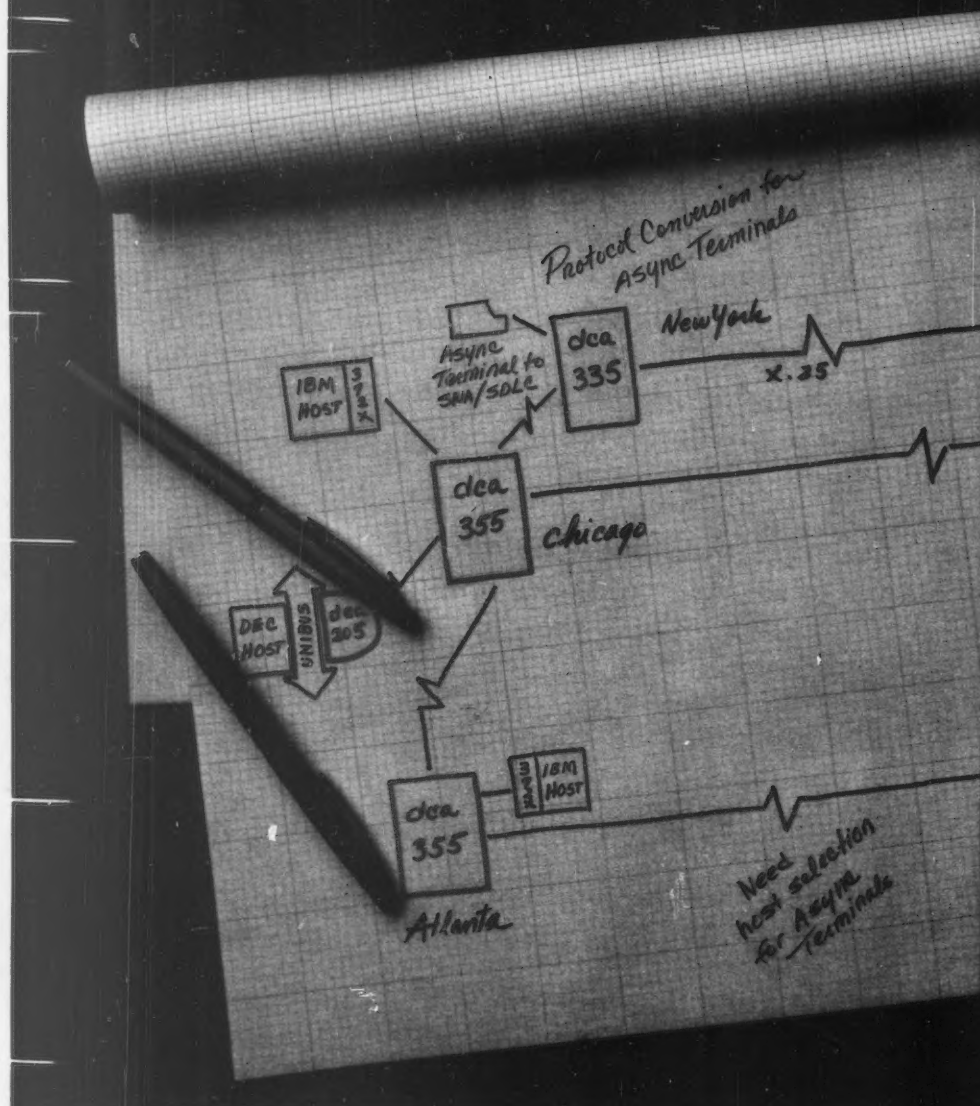
The TeleVideo 921



Terminals
© TeleVideo Systems, Inc.



Tektronix is a registered trademark of Tektronix, Inc.



NEWS

tact: Conferences and Institutes Program, University College, University of Maryland, University Blvd., College Park, Md. 20742.

JANUARY 8-10, CARY, N.C. — SAS Programming for New Computer Users. Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511. Also being held Jan. 22-24 in Cary, N.C.

JANUARY 8-11, NEW YORK — Vsam. Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001. Also

being held Jan. 28-Feb. 1 in New York.

JANUARY 9-11, NEW YORK — Systems Network Architecture: Concepts, Design and Implementation. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Gary St., Santa Ana, Calif. 92706. Also being held Jan. 21-23 in Los Angeles.

JANUARY 9-11, ARLINGTON, VA. — SAS Macro Language. Contact: SAS Institute, Inc., Box 8000.

Cary, N.C. 27511.

JANUARY 9-11, HARTFORD, CONN. — Unix C Programming Language Workshop. Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

JANUARY 9-11, CARY, N.C. — SAS Applied Time-Series Analysis & Forecasting Course. Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

JANUARY 9-11, CHICAGO — Relational Data

Bases. Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810. Also being held Jan. 14-16 in Atlanta.

JANUARY 9-11, WASHINGTON, D.C. — National Conference on Financial Management Systems for Government. Contact: U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

JANUARY 10, SAN FRANCISCO — T1 Carrier Strategies: The New

Networking Imperative. Contact: Marilyn Chasteen, The DMW Group, 2020 Hogback Road, Ann Arbor, Mich. 48104

JANUARY 10-12, HOUSTON — The Essentials of Productivity Management. Contact: The Institute of Industrial Engineers, Continuing Education Program, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

JANUARY 12-13, NEW YORK — CICS Command-Level Intensive. Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001. Also being held Jan. 19-20 in New York.

WEEK OF JAN. 13

JANUARY 13-16, NEW YORK — Annual Convention and National Retailers Business & Equipment Exposition. Contact: National Retail Merchants Association, 100 W. 31st St., New York, N.Y. 10001.

JANUARY 13-16, HONOLULU — Seventh Annual Conference of the Pacific Telecommunications Council. Contact: Pacific Telecommunications Council '85, Suite 308, 1110 University Ave., Honolulu, Hawaii 96826.

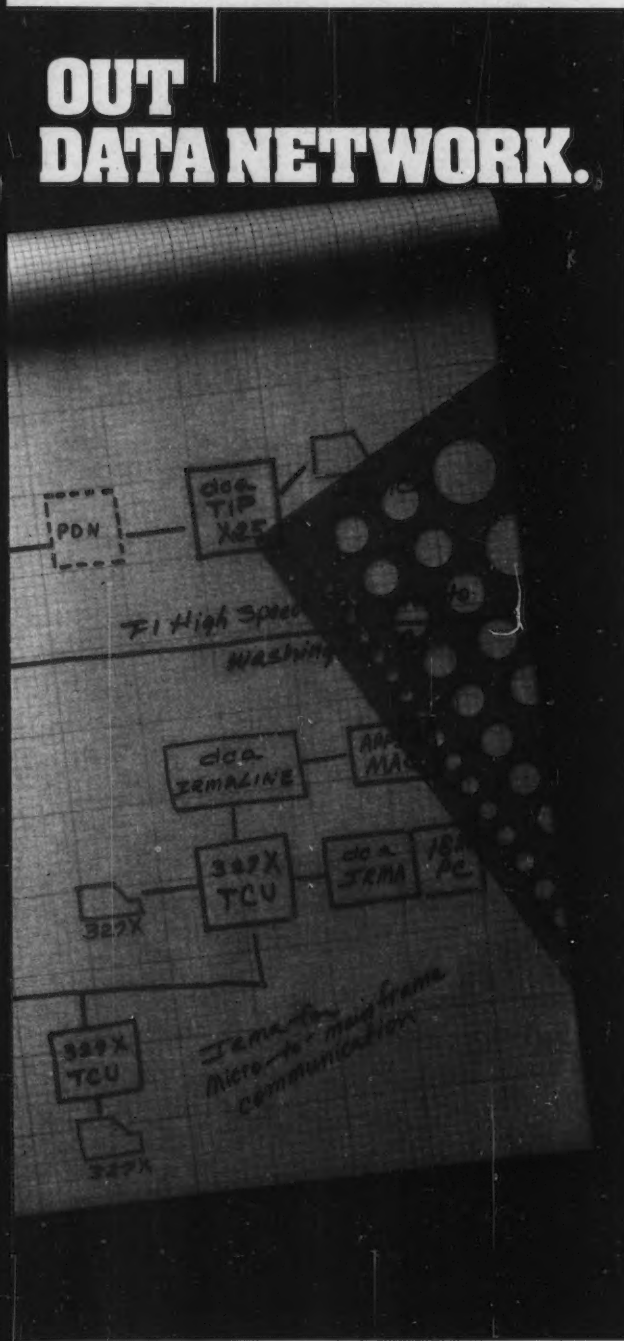
JANUARY 14-15, SAN FRANCISCO — Taking Charge: New Directions for Data Entry Management. Contact: Marilyn Bodek, Data Entry Management Association, P.O. Box 16711, Stamford, Conn. 06905.

JANUARY 14-15, HARTFORD, CONN. — Personal Computers — Hands-On Workshop. Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

JANUARY 14-16, ST. LOUIS — DOS/VSE Internals, Debugging & Problem Determination. Contact: Betty Bruce, Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

JANUARY 14-17, ANAHEIM, CALIF. — Cadcon West '85 Conference & Exposition. Contact: Morgan-Grampian Expositions Group, Two Park Ave., New York, N.Y. 10016.

OUT DATA NETWORK.



It's really very simple: A DCA network can integrate all your datacomm equipment — IBM or non-IBM — into one flexible, efficient system. We call it Integrated Network Architecture (INA). And it offers many remarkable advantages.

Like network transparency: Our hardware is compatible with all hosts and terminals — synchronous or asynchronous. So you're free to use less expensive async terminals and modems.

Host selection: With INA, any async terminal in the network can access any host in the network. Including IBM hosts, packet mode hosts and public data networks. And any 327X terminal can access any host running 3270 BSC.

High speed transmission:
You can transmit combined
voice and data at speeds up to
1.544 MBPS.

Modular hardware: You can upgrade and expand your network simply by adding—instead of replacing—low-cost DCA components.

And since data is routed through a network processor instead of a dedicated host, no host software is involved and no extensive programmer training is required.

Efficiency. Savings. Chalk them up to INA. From DCA, 303 Research Drive, Norcross, Georgia 30092. Call us toll-free: **1-800-241-5793.**



VAX

- BUY
- SELL
- TRADE

A AMERICAN
COMPUTER GROUP INC.
(617) 437-1100



The HP 3000 compu

However much you change, you're going to need both office automation *and* distributed data processing. Fortunately, one company gives you both in a single system.

Hewlett-Packard's HP 3000 is a fully compatible family of computers, ranging from a new system that handles as few as two users to a distributed mainframe that connects up to 400. You can run the same software right up the line.

And all of our systems can change and grow right along with you. Whenever you're ready for upgrades and additions, you simply plug your existing programs into the new systems. No recompiling. No time and money wasted on conversion.

A small, but mighty, addition.

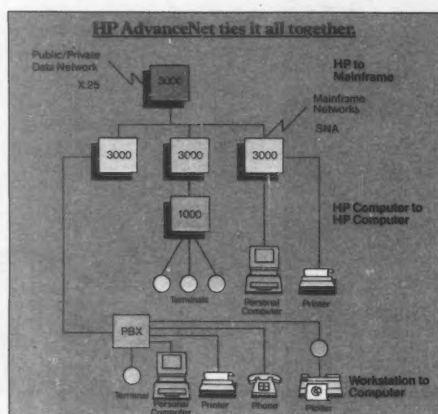
The new HP 3000 Series 37 Office Computer, the latest member of the family, puts the power of the HP 3000 within the reach of smaller budgets.

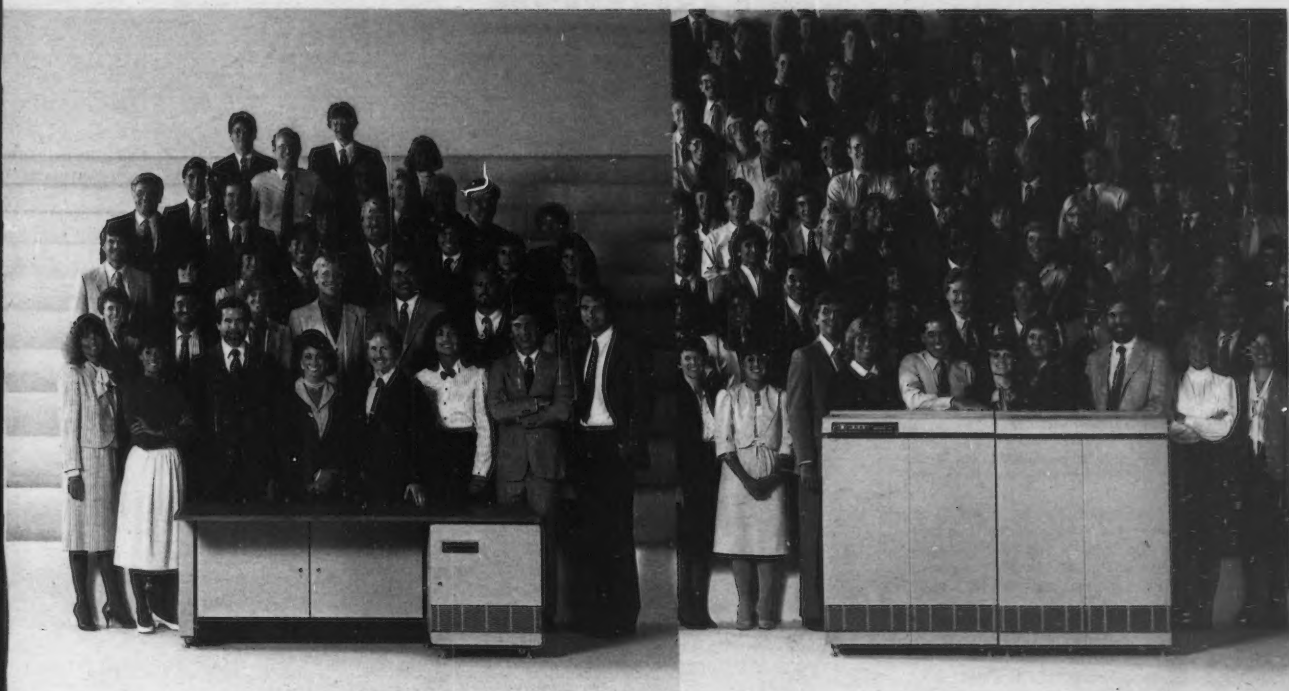
So now you can afford to give your branch offices and departments their own systems. And they'll still remain part of your overall DP picture with links to other systems.

In the office, the HP 3000 is the heart of our Personal Productivity Center. This integrates the information people need to get

their jobs done more productively.

It provides an interface for a wide range of workstations, peripherals and personal computers, including our Touchscreen





ter. One family fits all.

Personal Computer and The Portable, as well as IBM PCs. And it allows them to interact directly with the HP 3000. So your people won't have to learn DP commands.

**You'll communicate better with
HP AdvanceNet.**

Our communications go well beyond this office network. With HP AdvanceNet, they extend to links with other HP 3000s, in the same building or on the other side of the world. And to your mainframe computers, ours or IBM's.

Currently, more than 10,000 HP 3000 systems are working in networks so effectively that our communications were voted #1 in a national survey.

A Datapro poll also rated our service #1. So you get more than office automation and data processing in a single system. You get all the support you need from a single company.

For a demonstration of the single solution for both sides of your company, contact your local HP office listed in the white pages. Or write for complete information to Susan Curtis, Hewlett-Packard, Dept. 003203, 19055 Pruneridge Ave., Bldg. 46T, Cupertino, CA 95014.

In Europe, write Michael Zandwijken, Hewlett-Packard, Dept. 003203, P.O. 529, 1180 AM Amstelveen, The Netherlands.

We'll fit you no matter how much you change over the years.

Productivity. Not promises.



**HEWLETT
PACKARD**

EDITORIAL

Who's liable for DP security?

We went to some lengths last week in this space to make a case for the U.S. government's mass computerization of personal records, despite all the warnings to the contrary heard during this year of George Orwell.

Our point was that while the potential for harm to our civil liberties is ever present, the zeal to protect those liberties has acted as a defense against that potential harm.

During the past month, a titillating story has unfolded that makes a mockery of the term "system security," but this time in the private sector.

A reporter for *Newsweek* wrote an article in November casting youthful hackers in a bad light — to say the least — and recommended their punishment befit a serious crime. As television apparently no longer provides the vicarious thrills it once did to keep the youth of America preoccupied, hackers angry at the reporter broke into his credit files kept at TRW, Inc. They then posted the reporter's credit card numbers, purloined from the not-so-secure credit files. These were kids, using micros, telephones and modems, who have ingested a healthy dose of unmitigated gall and disrespect for privacy.

The hackers then proceeded to make life utterly miserable for the reporter, alerting others, via electronic bulletin boards, to make harassing phone calls to him. They also held what may be the first all-electronic "court" to decide what "sentence ought to be imposed on the reporter."

A couple of points: First, the hackers probably found breaking into TRW's credit files as easy as stealing a bank's password, which probably involved nothing more than picking through garbage for discarded computer print-outs.

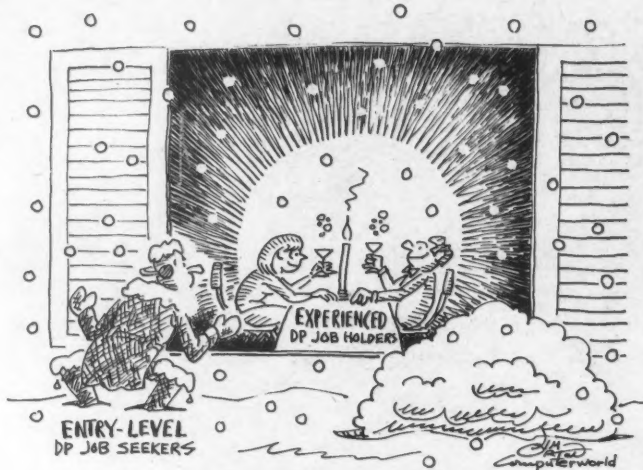
Second, this wasn't the first time in very recent history that someone broke into TRW. The company, which maintains credit records on millions of private citizens (120 million records, according to *Newsweek*), had its files illegally accessed in June [CW, July 2]. That time, the hackers apparently were content just to break in, leaving the files intact.

But in the more recent incident, the hacking was done with a vengeance and with a specific target in mind. Someone said, "Let's get this guy; I know just how."

TRW said it has done what it can to make its system secure. Clearly, that is far from enough and a poor excuse for allowing, if not inviting, more of the same.

Yes, there are laws against hacking. There are also laws against littering. Get caught doing either, and you're not likely to end up in jail.

Clearly, the responsibility for security rests with companies like TRW that dispense potentially volatile information on private citizens and with these companies' clients who use personal credit information like the Lenox (Mass.) Savings Bank, whose password was used in the illegal entry to the reporter's credit information. And if these companies cannot assume responsibility for security of personal files, what would happen if they were government agencies?



LETTER

Siding with employees

Concerning the article "GM employees win some, lose some in transfer to EDS" [CW, Nov. 12], it should be realized that takeovers like this always produce touchy situations for employees caught in the middle, though EDS has had more than its share of problems in this regard. However, EDS Senior Vice-President Ken Riedlinger's statement that "I don't think there is a company in the world that pays greater attention to the needs of employees than EDS" is absurd and must not go unchallenged.

The fact is EDS does not extend to its employees some basic benefits that are universally accepted, such as shift differential for hourly employees on night shifts and pay for accumulated vacation time not taken when an employee leaves the com-

pany. The firm did not give hourly employees time and a half for overtime until forced to by a court.

Additionally, the strict dress code, military atmosphere, policy of escorting employees out the door instantly when they resign, merciless after-hour demands put on its programmers and the infusion of H. Ross Perot's personal values into the regulations by which EDS employees must abide are great infringements on the rights of the people who work for EDS.

EDS has long recognized that many of its employees were quite unhappy with EDS policies. They have used internal surveys and commissioned outside help to identify the problems and made some changes based on the results. But the fundamental way EDS treats its employees has not changed.

See EDS page 40

COMPUTERWORLD

Donald E. Fagan
Publisher

Editor	Executive Editor	Managing Editor	Assistant Managing Editor
John C. Whitmarsh	Rita Shoor	Bill Labers	Donovan White
Senior Editors: Software Paul Gillin Communications John Dix Systems Tom Henkel Microcomputers Eric Bender Industry Peter Bartolik Features George Hamar Design Editor Marjorie Magowan International Editor Susan Blakney Associate Features Editor Barbara Van Sooyoc Assistant Features Editor Elizabeth Morse Special Reports Editor Janet Fiderio	Assistant Special Reports Editor Becky Batcha Senior Writer John Callant Staff Writers: James Connolly John Desmond Paul Korzeniowski Maura McEnaney David Olmos Donna Ramondi Edward Warner Correspondents: New York Correspondent: Charles Balcock Paramus Plaza 140 Route 17 N. Paramus, N.J. 07652 201/967-1350 Washington, D.C. Senior Correspondent: Bryan Wilkins Correspondent: Mitch Betts 1273 National Press	Building 529 14th St., N.W. Washington, D.C. 20045 202/347-6718 West Coast Bureau Chief: Jeffery Beeler Correspondents: Kathleen Burton Kathleen Sullivan 1060 Marsh Rd. Menlo Park, Calif. 94025 415/328-8064 Chief Copy Editor Kathie Gow Assistant Chief Copy Editor Charlotte Ziems Copy Editors: Christine Casatelli Deborah Fickling Patricia Heal Penny Janzen Joseph Stalvey Barbara Sutton Kimberly Valloch Lory Zoltola	Assistant to the Editor June Fetting Editorial Assistants: Lorraine Brien Cheryl Tynan Contributors Human Connection Jack Stone Turnaround Time Larry Long Microcomputers Thomas Madron The Data Center John P. Murray Lecht on Science Charles P. Lecht Special Publications Computerworld Extra George Hamar, Editor Computerworld Special Focus Ann Dooley, Editor

Main Editorial Office: Box 880, 375 Cochituate Road, Framingham, MA 01701 617/879-0700

Computerworld is a member of the CW Communications Inc. group, the world's largest publisher of computer-related information. The group publishes over 50 computer publications in 26 major countries. Nine million people read one or more of the group's publications each month. Members of the group include: Argentina's *Computerworld/Argentina*; Asia's *The Asian Computerworld*; Australia's *Computerworld Australia*; Australia's *PC World* and *Directors*; Brazil's *Destaque* and *MicroMundo*; China's *China Computerworld*; Denmark's *Computerworld/Denmark*; PC World; Finland's *Mikro*; France's *Le Monde Informatique*; Golden (Apple); GPC (IBM) and *Distributive*; Germany's *Computerwoche*, *Microcomputer*, *PC Welt*, *SoftwareMarkt*, *CW Edition/Seminar*.

Computer Business, *Run and Apple*; Italy's *Computerworld Italia*; Japan's *Computerworld Japan*, and *PersoCom World*; Mexico's *Computerworld/Mexico* and *ComputMundo*; Netherlands's *Computerworld/Benelux* and *PC World/Benelux*; Norway's *Computerworld Norge*; PC World; Saudi Arabia's *Saudi Computerworld*; Spain's *Computerworld/Espana*, *MicroSistemas/PC World*; Sweden's *ComputerSweden*, *MikroDe* and *Svenska PC World*; the UK's *Computer Management*, *Computer News* and *Computer Business Europe*; Venezuela's *Computerworld/Venezuela*; the U.S.: *Computerworld*, *Hot CoCo*, *InfoWorld*, *MacWorld*, *Micro Marketworld*, *PC World*, *Run*, *73 Magazine*, *80 Micro*, *Focus Publications* and *On Communications*.

VIEWPOINT

Those lovable cash robots



**LECHT
ON SCIENCE**
Charles P. Lecht

"I love those money machines," my friend said. No hassle; just walk right up, dial in your code, take a little quiz and if you pass it, the money machine pays off in twenties, tens, ones and sometimes even twos."

His statement got me thinking that almost all the people I work with, including me, use automated teller machines (ATM) — euphemistically referred to as money machines. While I don't know if I would ever go so far as to say that I "love" them, I must confess that they've proven to be an enormous convenience to me, and as far as I can see, to everyone else. They may qualify as the first white-collar robot in the history of mankind that most people actually like; in fact, some seem to love them.

For example, working New Yorkers seem to prefer them to lunch. Homemakers bring their kids in station wagons, which they leave double-parked with the motor running and a kid at the wheel, while they race in to use the machine. Often, a tail-wagging dog is seen in line. My Kerry blue terrier, Mozart, can't pass the place I use without lunging toward its door as he does in front of the deli.

Let's face it, we'll miss and perhaps never really be able to do without the clean-shaven, necktied, young teller who raised his eyebrow when given a withdrawal slip, checked your signature against his record card and begrudgingly handed over the cash. Or the sweet, crisply dressed woman who knew your entire financial history and tried to discourage you from wild spending by commenting on the weakening economy and what austerity measures a lame-duck president was likely to take after Christmas.

But, as much as we may miss this human inter-

action, we cannot let it stand in the way of progress and must bid it good-bye in favor of those lovable (oops, I said it) little cash-machine robots. Anyway, now you may withdraw more cash than you ought to with the confidence that no one but your computer knows.

Some ATMs are dressed like Santa Claus for the holidays. Because so many people will use ATMs for the first time this Christmas, I thought I'd give some practical advice on the subject.

First of all, I want to confirm that once having identified yourself to the machine by keying in your code name and answering all the multiple-choice questions correctly, the lovable robot's gaping, steel mouth usually opens to provide you with cold, hard cash. No recriminatory, guilt-producing remarks are made, nor does the robot change its expression. You are now free to go on a spirit-lifting spending spree.

Visit machine alone, at night

This being an imperfect world, not all cash withdrawal encounters with an ATM actually produce cash. It's extremely rare that the machine is at fault (although they do run out of cash) and far more likely that you are (having run out of credit). While failure at the machine doesn't inspire the disapproving stares of a bank employee, it's usually better if you visit the machine alone at night if there's any doubt that you'll succeed in your contemplated transaction.

When you do this, it may be wise to ensure that a policeman is within earshot. Lose a video game, and no one pays attention; an unsuccessful session with an ATM can attract it. Most ATMs are situated in such a way that people awaiting their turns, accompanying friends or peering through windows may figure out what you're up to in visiting the machine, especially if you display any kind of negative emotion during use.

I advise that a transaction that doesn't produce the cash you wanted, especially around the holidays, should be responded to with a smile, as though the denial message on the tube were nothing more than confirmation of a large excess. Leaving disgruntled can cause others to wonder why you've been turned down and may inspire them to

exhibit standoffish or aloof behavior. Mumbling "I guess it's out of cash," and posting a sign to that effect is unwise. If someone decides to try to use the machine anyway, it can ruin your credit with local merchants.

Faceless automation and societal breakdowns

If you have a friend waiting for your transaction to produce cash that you were going to turn over as a loan or, worse, as a loan repayment, and none appears, you may do well to curse faceless automation as the source of too many societal breakdowns and laughingly express a longing for the good old days when you could talk to someone to straighten the matter out there and then. Of course, you must make sure the bank isn't still open.

It's better not to take children under 13 to an ATM that is dressed as Santa because of the still unproven but suspected aftereffect of a hard-to-cure machine attachment in the still-believing-in-Santa child. And never send any kid under, say, 150 lb, however trustworthy he may be, to the money machine without first hiding a transmitter in his clothing. Remember, there's no bespectacled teller to see the child who's asking for the cash but plenty of people to watch him get it.

And, never key in your secret code with a baby who is on the verge of reading perched on your arm. Later on, he'll be able to reach the keyboard and gaping robot's mouth and, well, kids will be kids.

On rare occasions, our lovable cash robots break down and turn over more cash than you've asked for. Some have been known to exhibit extreme generosity by turning over all the cash they've got, hiccupping it out \$200 at a time. The odds of this happening are very low, but I thought I'd mention it before I close.

Suppose the machine does start to hiccup up all its cash, what should you do? Procedures for handling this vary from bank to bank, so my advice ends here. But my instincts tell me that you may want to avoid rejoicing or kissing the lovable robot. Better to look disgusted, punch it, angrily tear up some withdrawal slips, and take the money and run. Happy holidays.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

DBMS role in fourth-generation languages



READER'S PLATFORM
Ken Zearfoss

With the current proliferation of user-friendly fourth-generation languages, there has also been an increase in the number of so-called user-friendly data base management systems. Many fourth-generation languages claim to be or include their own DBMS. As with other data processing terms, the term DBMS has been kicked around quite a bit, being applied to anything that uses indexed files. To what extent do these languages offer fully functional DBMS capabilities?

To answer this question, we should first identify the essential characteristics of a DBMS. I believe that there are four such characteris-

tics a DBMS must provide.

- The ability to define logical access paths/methods that are distinct from the physical access paths/methods.

- The ability to define a logical unit of work.

- The ability to share data between various users and applications.

- Adequate recoverability and auditability.

Let's examine these characteristics in more detail and see if a fourth-generation language approach can provide the functions necessary for each.

The first logical access paths/methods, is in a traditional DBMS accomplished through pointers and/or secondary indexes. A fourth-generation language will create alternate paths through the data in the same way but will often not need to be

told at file definition time what physical means to use to accomplish this logical access. (If physical means must be specified in a fourth-generation language,

these specifications are considerably simplified from those necessary for a traditional DBMS.) The advantage of this is that time, effort and expertise need not be spent up front to develop a file which may be viewed in different ways. A disadvantage is that tuning for minimal usage of computer resources through these logical accesses is much more restricted, a disadvantage that will have less and less impact as man-hour costs rise and computer costs fall. Fourth-generation languages do a fine job of providing users with file views.

The second characteristic, a logical unit of work, can be considered to

be a grouping of one or more transactions that must be either completed or aborted as a whole, if the data they operate against is to retain its integrity.

For example, consider the transfer of \$1,000 from one account into 10 accounts of \$100 each. It should be obvious that for this transfer to be completed properly, 11 separate update actions must be performed. (The \$1,000 should be deleted from the first account, and 10 separate additions of \$100 should be made against the other accounts.) By defining this transfer as a logical unit of work, one can expect a traditional DBMS to complete or reject the transfer.

A traditional DBMS supports a logical unit of work through two concepts. The first of these is the data queue. When, during a logical unit of work, changes are made to the data, these changes are written to the data queue and are not written back to the file until this logical unit of work is complete. Thus, if an abend occurs during an update action within a logical unit of work, none of the changes

See DBMS page 40

The lack of support from fourth-generation languages for a logical unit of work is a fatal flaw to their claim to provide DBMS capabilities.

Zearfoss is a member of a newly formed Pittsburgh-based data base design group that develops subject data bases.

VIEWPOINT

DBMS from page 39

made by prior update actions within this logical unit of work are applied to the file. In this way, the integrity of the data is ensured.

At this point, the second concept, dynamic back out, takes over. Dynamic back out removes all the changes written to the data queue by the update actions for an unsuccessfully completed logical unit of work. This frees up the data queue for receiving

changes from other update actions.

To the best of my knowledge, no fourth-generation language supports the logical unit of work characteristic. A fourth-generation language will provide data integrity to the data base call level, but as seen from the example above, this is not always sufficient to guarantee data accuracy. The lack of support from fourth-generation languages for a logical unit of work is a fatal flaw to

their claim to provide DBMS capabilities.

Data sharing is the third characteristic, and one that, for the most part, fourth-generation languages satisfy. Files may be updated by more than one user simultaneously. However, there is an aspect of data sharing that fourth-generation languages do not address. This is program isolation, the resolution of data contentions. Since fourth-generation languages fail to provide for a

logical unit of work, they must treat each data base call as a separate, recoverable action. This means that a procedure is unable to lock out any other procedure from using any data base record other than the one referenced by its most current call. If one considers the example of the \$1,000 transfer given earlier and adds to it a separate transaction to update one of the receiving accounts, one can see where problems may occur. Since

fourth-generation languages provide no data contention checks, it is up to the programmer to supply code for all possible conditions of data contention.

The final characteristic, recoverability and auditability, refers to whether sufficient and usable logging of activity and updates against the file are maintained. In my experience, fourth-generation languages do not provide adequate logging capabilities. This means that logging functions must be created anew for each application. Worse yet, there can be no vendor-supplied utilities for reading a self-developed log file. Thus, it becomes the responsibility of the programmer to supply the code that will ensure that auditability and recovery can take place.

What can we conclude from all this? If the four characteristics I mentioned earlier are accepted as essential for a DBMS, then we can say that fourth-generation languages only partially satisfy two of these characteristics and entirely fail to support another one. This means that if you still wish to use a fourth-generation language as a DBMS, you will be forced to accept systems where your programmers coded the routines to resolve data contentions and provide auditability and recovery and where, because of a lack of data queues and dynamic back outs, the integrity of the data within this system can never be assured.

I believe that fourth-generation languages are extremely powerful and flexible tools for creating data processing systems and, as they continue to evolve, will play a larger and larger role in the overall data processing world. However, for the present, they provide incomplete DBMS capabilities and should not be used as such.

EDS from page 38

In 1980, EDS started requiring programmers to sign three-year, \$9,000 promissory notes before taking part in EDS' programming training course. This unusual move was deemed necessary to keep programmers from leaving. Surely this would not be necessary if EDS "takes care of every legitimate employee need."

EDS is unique in many ways. It has been innovative, provided excellent education and developed very good computer systems. If EDS would like to take pride in its uncompromising methods, that is one thing. But Riedinger's claims are just not true. EDS has gained a well-deserved reputation as a company out of touch with its employees' needs.

Douglas Miller
Foster City, Calif.

altergetherness.

Altergo, the mainframe systems software products division of THORN EMI Computer Software, offers an unrivalled range of products backed up by first rate professional support.

THORN EMI Computer Software is a major force in the marketplace. It has been created from all the software interests of THORN EMI to become a single company dedicated to the development, distribution and support of software products. THORN EMI is a multi-billion dollar international corporation whose interests include information technology, electronics and the entertainment industry, and currently operates in 33 countries and exports to more than 140.

Quota II, CPG, DATAMAN II, FQS and HOST run under CICS as well as SHADOW II. DL I and IMS DB are supported by those products that access corporate data.

SHADOW II

The teleprocessing monitor that provides the means for the complete integration of on-line software products. Ease of use and high performance produce cost savings.

CPG

Communications Program Generation. The most efficient way of generating on-line applications. Full online facilities including screen design and validated program entry, cut down development costs.

QUOTA II

The development aid for QOS/VS(E) systems. QUOTA II is used by all members of the DE department and provides the most complete range of facilities, including performance monitoring.

FQS

Friendly Query System. FQS allows end-users to access corporate data online with a completely ad hoc query. The user decides the data for display and selection and can route the results to a printer, into a graphics package or download to a PC for further processing.

DATAMAN II

Report retrieval system for the creation of batch applications. DATAMAN II has an on-line interactive interface for rapid report generation.

HOST

The latest addition to the family of products is the HOST Office Automation System. HOST enables all office functions to be carried out on-line with massive improvements in productivity and inter-office communications.

software products from
altergo

Call us today for further information

Altergo Products Inc.
100 West Cummings Park
Woburn MA 01801
Telephone: (617) 938 8811 Telex: 951265



THORN EMI
Computer Software

SOFTWARE & SERVICES

Micro-mainframe links pose array of security risks

By Owen Boyd
Special to CWT

The driving force behind micro-mainframe technology is simple: Today's end user wants to get at his mainframe data with his personal computer. He wants to manipulate that data, and he wants to have the ability to update these mainframe data bases in real time and interact with his data without having to wait on DP to perform batch runs.

The new technology he is using to do this is the microcomputer-mainframe link.

This tool allows companies to be more productive and to compete on a higher level at a faster pace than ever before. But with this freedom of access come some very serious security risks. Before a plan is described to offset these risks, it is important to understand how the technology works.

Before link technology, it was possible to access the mainframe, but it was a tiresome process. First the user had to key all of that data into his personal computer. Often the data was inaccurate or old, leading to the danger of making bad decisions. Once the user had done his analysis on the personal computer, there was no way for him to update directly the mainframe data bases with the results of his analysis — he needed to enter the data again.

Micro-mainframe link software, in the simplest sense, allows the passing of data from the mainframe data base to the micro and from the micro to the mainframe.

Users can now access live mainframe data, select what they want when they want it and manipulate the data in unrestricted ways. In some cases, they have the option of updating the mainframe in real time. While the benefits are striking, so are the security implications.

A typical user of a micro-mainframe link might be a controller who is trying to close his month-end books. Suppose it is the last day of the month, and he has per-

See LINK page 48

Boyd is manager of product marketing and systems at McCormack & Dodge Corp., a vendor of a micro-mainframe link.

Avoid system design troubles by taking one block at a time

Second of a two-part series.

By Mike Ruggera
Special to CWT

A typical procedure used when approaching the problem of developing a major system that consists of subsystems is to view the system as a single project. An effort is then made to analyze the data needs of all the subsystems and then integrate those needs into a composite data base design.

The complete schema is written and all the anticipated subschemas are written. Work begins on programming the first subsystem. Usually there are some unanticipated data requirements necessitating changes in both the schema and subschema. These changes cause some programs to be modified or rewritten because techniques that result in a lack of indepen-

dence between the data and the programs have been employed. This results in some time and cost overruns, but the subsystem is completed.

Then work is begun on the second subsystem. The project manager believes he has a good feel for how long this subsystem will take to develop and prepares time estimates and work plans. The programming begins. Invariably, there are unanticipated data requirements. The schema and subschemas have to be changed. As a result, not only do the programs in this subsystem have to be modified or rewritten, but the programs of the first subsystem also have to be modified or rewritten. This is because they are tied to the structure of the data base. Consequently, when the second subsystem is completed, it overruns its time and cost estimates by about 20%.

The project manager usually believes he understands how to estimate the third subsystem and includes an inflation of 20%. The anticipated but unknown data

See DESIGN page 39

Ruggera is a data processing management consultant based in Fords, N.J.

Honeywell offers HDMS in U.S.

MINNEAPOLIS — Honeywell, Inc. has announced that its Distributed Manufacturing System (HDMS) for the company's DPS 6 line of minicomputers under Honeywell's Gcos MOD 400 or TPS 6 operating systems is now available in the U.S.

According to a spokesman, HDMS operates on-line and is designed to support a variety of manufacturing functions, including long-range planning and daily shop floor control. Developed by Honeywell Information Systems in the UK, HDMS reportedly enables users to integrate their manufacturing systems with office automation and other DPS 6 applications. Key features of HDMS include requirements planning, contract control and material traceability.

HDMS allows requirements planning to run on spare machine capacity to reduce overnight processing loads. This feature reportedly lets users see the immediate results of shop-floor or purchasing activity

as updated replanning suggestions.

Using contract identification of work and purchase orders, HDMS relates the cost of all activities to their appropriate contracts. The integration of job costing with the production planning function is said to enable the system to determine the remaining work on a contract and the cost of completion.

The system's material traceability features allow it to maintain the identity of individual material batches and record the subsequent use of each batch in manufacturing operations.

Other features include bill of materials, inventory control, sales order recording, purchase order recording, work order control and master scheduling functions. The system is priced at \$55,000 for a one-time license. The price includes one year of support, training and installation.

Honeywell is located at Honeywell Plaza, Minneapolis, Minn. 55408.

DEC adds voice messaging options to All-In-One system

Tools automatically notify users of messages, allow telephone access; OA options offered

MAYNARD, Mass. — Digital Equipment Corp. has broadened its All-In-One Office and Information System software with the addition of voice messaging options and support for several other optional office automation products.

The two voice products — Dectalk Mail Access and Voice Messaging Support — reportedly allow users of DEC's All-In-One package to access electronic mail messages and other All-In-One documents over any Touch-Tone telephone and receive voice message notification in their All-In-One mailboxes.

According to the company, Dectalk Mail Access permits users to "read" messages or documents stored in their All-In-One filing folders by using their telephones. Users can call an electronic mailbox and listen to electronic messages translated into voice by Dectalk, a text-to-speech voice synthesizer. The telephone can also be used to listen to

mail in the user's in-box, select specific messages, delete mail and answer mail. Users can stop, pause, resume or repeat the messages.

Voice Messaging Support is an option that automatically notifies users of voice or text mail through their All-In-One terminals. Information on who sent the message, when it was received and the message length is included in the text. By entering a command, the user's telephone will ring, and the message is delivered.

Dectalk Mail Access software for the All-In-One system is priced at \$4,500. All-In-One Voice Messaging Support is available for \$7,500. Both products will be available in the spring, the company said.

Along with the voice messaging option, DEC introduced versions of a full-function word processing system for All-In-One and for its VMS operating system. WPS-Plus/VMS Version 1.1 and

WPS-Plus/All-In-One are said to include Decmate-style word processing, a scientific and technical character set and equation editing.

Users can delete and insert text to different pages and documents without losing word processing functions, the company said. Letters can be combined with spreadsheets, calendar information and other text created through the All-In-One application and distributed by electronic mail. WPS-Plus/All-In-One is licensed for \$4,000. WPS-Plus/VMS is licensed for \$6,000. Both products will be available in January. Also announced by DEC:

■ Decpage Version 1.1, for VAX computers, reportedly allows text, line drawings and graphics to be printed in one compound document. It will be available in January for \$5,000.

■ Message Router Version 1.1 is a store-and-forward message transport system for the VAX line

See DEC page 49

INSIDE

Systems
Software/44

Productivity Aids/44

Application
Packages/45



IF YOU'RE BUYING YESTERDAY'S ...WILL YOU BE PUTTING YOUR

FOR ADVANCED COMPUTER SYSTEMS
TALK TO DATA GENERAL.

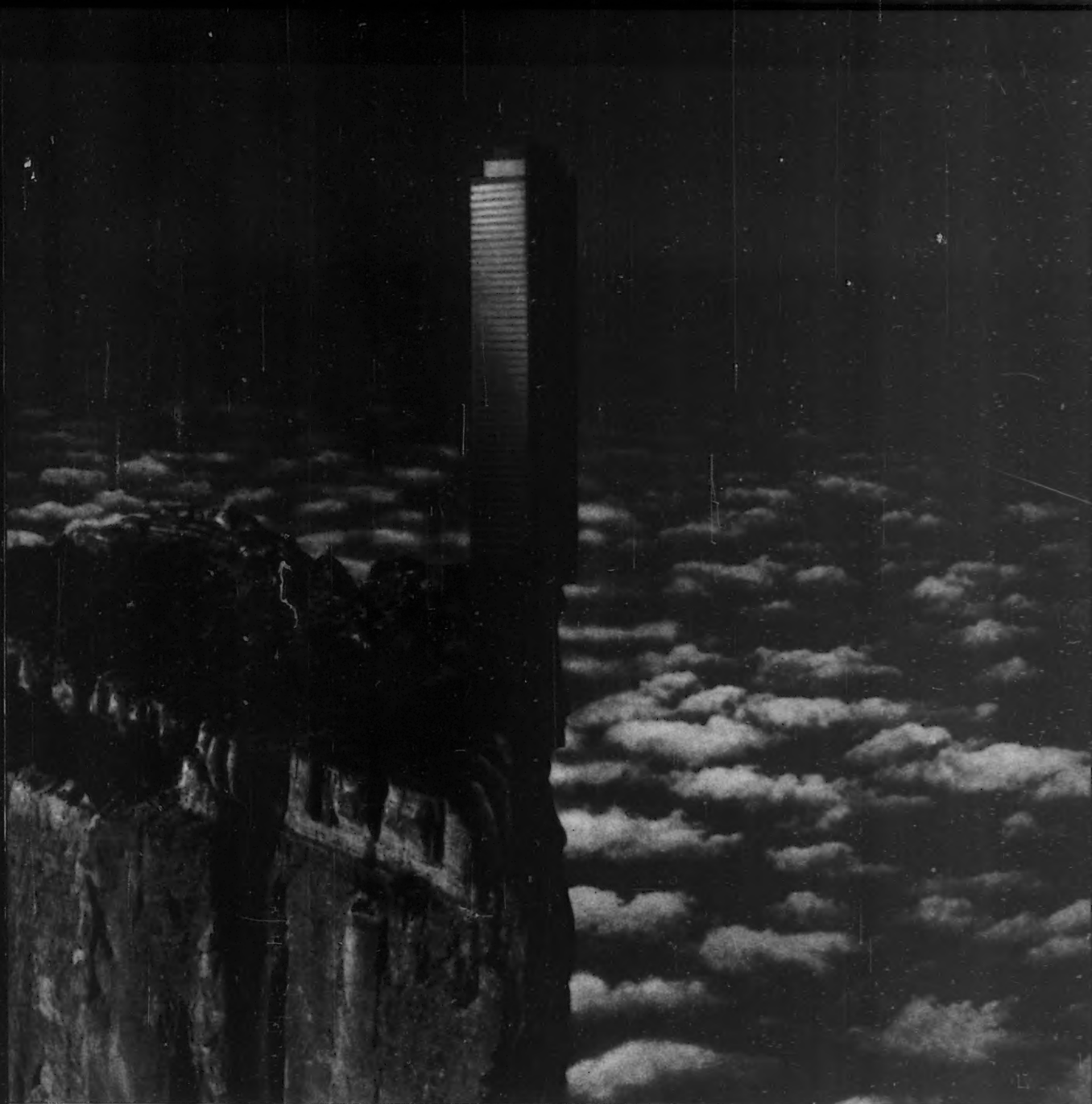
IT'S WHY WE'VE WON MORE MAJOR INTEGRATED SYSTEM CONTRACTS
THAN ANY OTHER COMPANY.*

The choice of a computer system may be the most crucial decision a corporation can make. And companies such as Beneficial Finance, Pactel Communications, Centel and E.F.Hutton selected Data General.

TODAY'S BEST VALUE
From our DATA GENERAL/One™ portable to our powerful superminis. Along with our unparalleled software and our CEO® office system, we offer a

comprehensive computer value. That's why our automation systems for business and industry are leaders in price/performance.

*Integrated system contracts over \$25,000,000 (does not include military, component and service awards), as reported in *Electronics News*, *MIS Week* and *Computer Systems News* since January 1, 1983.



TECHNOLOGY... COMPANY ON THE BRINK?

PROTECT YOUR CURRENT INVESTMENT

With our systems you can use your existing equipment and protect your current computer investment. Because Data General is compatible with IBM and works with most other major makes of computers.


What's more, Data General ties into almost any industry standard computer network. Which puts all your equipment, regardless of make, on speaking terms. And makes your entire information system more productive.

SOLID SUPPORT FOR THE FUTURE

Our support and service is advanced too. So you'll always use our technology to its highest potential. And our high priority on research and development will keep your systems a generation ahead of everyone else's.

Can you risk being caught on the brink with yesterday's technology? To stay on solid ground, talk to Data General at 1-800-DATAGEN or write: Data General, 4400 Computer Drive, Westboro, MA 01580 M-S C228.



 **Data General**
a Generation ahead.

DATA GENERAL/One is a trademark, and CEO is a registered trademark of Data General Corporation. © 1984 Data General Corporation, Westboro, MA

SOFTWARE & SERVICES

SYSTEMS SOFTWARE

TRIANGLE SOFTWARE CO.
Product 2.0

Triangle Software Co. has introduced Version 2.0 of its Product systems utility for IBM mainframes running IBM's VM and MVS operating systems.

According to the vendor, Product 2.0 now includes an option that permits users to access data by their assigned job network names.

Context-oriented Help panels have been added to the Structured Programming Facility interface and are said to provide information about the subcommand or function when the help is needed.

Product 2.0's control statement reportedly allows users to delete entire sets of jobs by specifying a combination of the job name and wild card characters, the vendor said.

Release 2.0 is available for \$3,750. Triangle Software, Suite 275, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

EXECUTIVE SUPPORT
PRODUCTS, INC.

Aces

Executive Support Products, Inc. has announced an editing system for the Honeywell, Inc. Level 66 DPS 8 series and DPS 88 mainframes.

According to the company, the Aces package was developed for use with the Honeywell 7700 and 7800 series terminals to provide a program and documentation development tool to improve productivity.

Aces reportedly maintains full control over cursor position within the edit screen and recognizes and directly supports most Honeywell file formats, including Ascii, Binary Code Decimal, compressed deck and print formats.

Aces is available for a license fee of \$7,900 per CPU.

Executive Support Products, Suite 211, 3901 MacArthur Blvd., Newport Beach, Calif. 92660.

CHAKRA SYSTEMS
INTERNATIONAL
Go/38 Release 4.0

Chakra Systems International has introduced Release 4.0 of Go/38, designed to enhance control of the IBM System/38 on-line environment.

Enhancements to the product are said to include a command that allows users to remotely execute commands at any workstation linked into Go, statistical reports designed to identify workstation and program use and a restricted sign-on function that can be used to permit unattended start-ups.

According to the vendor, other enhancements include a list option that reportedly dumps detailed status of active workstations to the printer and simplifies backup procedures.

Go/38 is priced at \$3,000, according to the vendor.

Chakra Systems International, 8465 Victoria Drive, Vancouver, B.C., Canada V5P4A8.

BOOLE & BABBAGE, INC.
XPF/Cobol Version 1.1.2

Support for IBM's IMS/VS and MVS/XA has been added to Boole & Babbage, Inc.'s interactive testing and debugging tool for use by Cobol

programmers.

XPF/Cobol Version 1.1.2 allows application programmers to monitor and correct programs at their terminals, the vendor said. Other enhancements added to the product allow users to obtain a storage dump after a programabend.

Pricing for XPF/Cobol Version 1.1.2 is \$30,000 for the first site, and each additional site costs \$22,500.

Boole & Babbage, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

PRODUCTIVITY AIDS

DBMS, INC.
Developer Tool Kit

A package of application development products for users of Cullinet

Software, Inc.'s IDMS has been announced by DBMS, Inc.

According to a spokesman, the Developer Tool Kit is a package of eight software modules, three of which are currently available.

Online Test is designed for testing Cullinet's ADS/Online dialogs and IDMS-DC Cobol and Assembler programs.

Dictionary Module Editor is a full-screen editor that reportedly allows IDMS users to do on-line edits of Cullinet's Integrated Data Dictionary.

The Dictionary Migrator is designed to simplify migration of systems from testing into production, according to the vendor.

The package sells for \$14,900. Users of DBMS's DBA Tool Kit can buy the Developer Tool Kit for \$12,500.

DBMS, 1801 Mill St., Naperville, Ill. 60540.

APPLIED DATA RESEARCH, INC.
ADR/DL

Applied Data Research, Inc. (ADR) has announced that its ADR/DL, an interactive application development system for ADR's Datacom/DB and IBM's IMS data base management system, now allows for Cobol-based application development and maintenance. The package runs on IBM and compatible mainframe computers under IBM's OS and DOS environments.

The new function allows programmers developing and maintaining Cobol applications to access conventional files as well as Datacom/DB and IMS data bases. Existing Cobol programs not originally developed with ADR/DL can also be maintained.

ADR/DL is now compatible with Sketch, the CICS screen painting fa-

*Give people the tools they need,
and there is no limit to what they achieve.*

*Announcing the first major
breakthrough in word processing
technology since WordStar.*

*Now, state-of-the-art
comes easy.*

Introducing WordStar 2000, a totally new word processing program from the makers of WordStar.

WordStar 2000 removes all limits from word processing. From what you can create. From what you can achieve.

Because WordStar 2000 lets you do everything.
Easily.

**From windows, to undo,
to spelling correction, WordStar 2000
does it all. And more.**

WordStar 2000 gives you the works. "Windows" allows you to work on different documents—simultaneously. "Undo" lets you replace text you mistakenly removed. A built-in spelling corrector checks and corrects misspellings from over 97% of the most commonly used words.

WordStar 2000 also has a "typewriter mode" to fill in forms or envelopes easily. Plus "format sheets," which give you ready-made

headings, tabs and margins at the touch of one key. It can even create and update footnotes.

**Finally, a truly integrated
word processing system.**

WordStar 2000 goes well beyond words. It comes with a built-in five function calculator. A built-in mail merge enables you to mass produce form letters. Get our special Plus package and you also get a built-in mail list data base that allows you to create, update and sort your own mailing lists. Also a built-in indexer. Not to mention built-in telecommunications capabilities.

All integrated together, so you never have to leave the program.

**The only word processing program
that interacts with you on your level,
whatever your level.**

Before we created WordStar 2000, we studied the way people worked, and thought. We also drew from our experience with over 1,250,000 WordStar owners.

SOFTWARE & SERVICES

cility of ADR/Roscoe and ADR/Vollie for OS and DOS respectively.

The permanent license price for ADR/DL is \$25,900 for OS environments, \$21,300 for DOS environments and \$16,000 for IBM Models 4321, 4331, 4361 and 370/115, 370/125, 370/135 and 370/138 or plug-compatibles.

Applied Data Research, Route 206 and Orchard Road, CN-8, Princeton, N. J. 08540.

APPLICATION PACKAGES

SHAWWARE, INC.
Facilities Maintenance Management System

Shawware, Inc. has introduced a

facilities maintenance control software system for the IBM System/38 minicomputer.

According to a company spokesman, the Facilities Maintenance Management System consists of seven modules.

These modules include work order management, manpower allocation, equipment management, preventive maintenance, stores' inventory control, purchase order management and accounts payable.

The modules can be purchased separately or together as the fully integrated Maintenance Management System.

Prices for the software range from \$10,000 for a single module to \$80,000 for the complete system, the spokesman said.

Shawware, Suite 2J, 2075 S.W. 1st Ave., Portland, Ore. 97201.

VERSATEC

Versaplot Color Random software

Versatec, a Xerox Corp. company, has introduced plotting software to support electrostatic color plotting with Prime Computer, Inc. computers running under Prime's Primos 19.2 operating system. The software is used in conjunction with the Versatec Random Element Processor and Versatec electrostatic color plotter.

The Versaplot Color Random software supports 16- or 32-bit integer mode, allowing a 16-bit host to produce up to 13.65-ft-long plots and a 32-bit host to produce up to 40-in.-wide plots of virtually any length, the vendor said. The plotting software provides for eight line colors, 256 predefined area colors and 256 user-definable colors. The software also supports black-and-white plot-

ting, Versatec said.

The price of the Versaplot Color Random software for Prime computers is \$4,000.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

HERITAGE COMPUTER CORP.

Business Oriented Support System

Heritage Computer Corp. (HCC) has released inquiry software for the property and casualty insurance industry. The software is a supplement to HCC's property and casualty software products and runs on IBM 30 and 4300 series computers under IBM's DOS, OS or MVS operating systems.

The Business Oriented Support System (Boss) was designed to give executives direct control of the corporate data base without any data processing knowledge, the vendor said.

Users can formulate questions either against the data base through a series of menu choices or by using a series of tutorial screens.

Boss will be available at the end of first quarter of 1985. Pricing starts at \$50,000.

HCC, 2800 S. Taylor Drive, Sheboygan, Wis. 53081.

DATA PROCESSING DESIGN, INC.

Word-11

Data Processing Design, Inc. has announced that its Word-11 word processing software now interfaces with the Hewlett-Packard Co. Laserjet printer and the Xerox Corp. 2700 Distributed Electronic Printer. The software runs on Digital Equipment Corp. computers under DEC's VMS, RSTS/E, RSX-11M and P/OS.

With laser printers, the user can choose multiple fonts on a single page without stopping the printer. Word-11's spooled printing allows users to share printers, and users can continue to create or edit while other documents are printing.

Word-11 for the Professional 350 costs \$795, and prices for larger machines range from \$6,000 to \$9,500, depending upon configuration.

Data Processing Design, 1400 N. Brasher, Anaheim, Calif. 92807.

DATA PROCESSING DESIGN, INC.

Figure Module in Graphics-11

Data Processing Design, Inc. has added a two-dimensional drawing module to its Graphics-11 software that runs on Digital Equipment Corp. processors under DEC's VMS and RSTS/E operating systems. Figure requires either DEC VT125 or VT240 series terminals.

According to a company spokesman, the Figure module enables users to create and edit graphics images and then receive hard-copy output from printers, plotters or 35mm slide generators. Objects can be moved, scaled or copied to create almost any graphics image needed for business applications, the vendor said. Colors, patterns and text can be added to enhance the illustration.

The price of the module ranges from \$2,000 for a DEC Micro-11 to \$3,500 for a VAX-11/780, and the Graphics-11 package, including Figure, ranges from \$3,200 to \$5,600, depending upon host configuration.

Data Processing Design, 1400 N. Brasher, Anaheim, Calif. 92807.



As a result, the keys you press are the keys you'd expect to press ("c" for copy, "p" for print, etc.). You may also use your computer's function keys. Menus have been uniquely designed for easy access to all functions. And MicroPro's exclusive "tutor-in-your-computer" makes learning fast and fun.

WordStar 2000 is the easy word processing program you'll never outgrow. Of course, the original WordStar and WordStar for PCjr will continue to provide substantial and proven word processing capability for those with more modest budgets.

See your local MicroPro dealer today or call (800) 227-6703 [in CA (800) 632-7979] for the dealer nearest you.

So you can remove all limits from what you can achieve.

Current WordStar owners can upgrade to WordStar 2000 quickly and easily through their dealer, or by calling MicroPro Customer Update (800) 227-5609, 9am-3pm P.S.T.

WORDSTAR
2000

Now there are no limits.™

MicroPro

One of the smartest
reasons to buy Digital.

Digital Service.





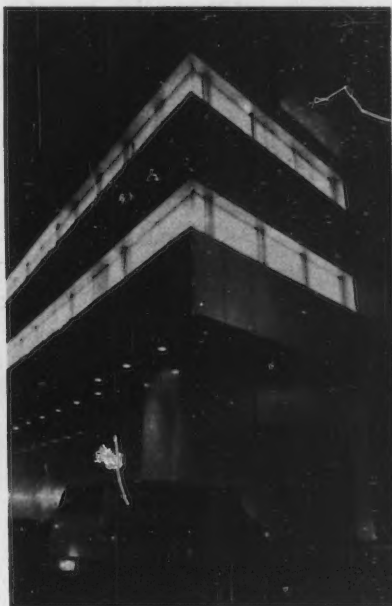
From the moment you choose Digital, our service organization goes to work to protect your investment. We'll develop your software applications. Train your employees. Keep your system up and running. We're ready to provide the support you need, whether you are running a single system or a large network of systems. Our engineers have even worked alongside customers to build new computer sites with the proper power, air conditioning, and fire protection. From start to finish, Digital Service is a smart decision.



Our people help your people develop the skills they need to get the most out of your Digital computer. We offer more than 500 courses on hardware, software, and office automation. At Digital's worldwide Training Centers. Or at your location. And, at your request, we will even customize training to meet your special needs.



Because no other business is like yours, Digital's software experts help you select the right applications for your business. Or they tailor programs to fit the way you work. And whenever you need the answer to a question or problem, specialists trained in your software applications are only a phone call away.



You select the level of service you need: whether you need on-site hardware support 24 hours a day, seven days a week, with our unique commitment to when service will begin, or the economy of carry-in or mail-in services. Digital gives you a choice.



Digital has over 20,000 service professionals worldwide to give you peace of mind with fast, personalized service. And we deliver that service when and where you need it. That's why Digital Service is the smart choice.

Digital Service is everywhere, because Digital's customers are everywhere. Our specialists regularly service Digital's systems on remote islands. On board ships. Even at the South Pole.

For more reasons to buy Digital Service, call 1-800-DIGITAL.

digital™

© Digital Equipment Corporation 1984

SOFTWARE & SERVICES

LINK from page 41

formed his preliminary close in the traditional manner. A big block of paper has been printed out in multiple copies, and he is evaluating his performance to budget for the month. He has some final adjusting entries to make, errors to clear up and he is under pressure from his board to produce the numbers for an important meeting in two days.

The controller needs to be able to call up the journal entry screens from his personal computer, enter his adjusting transactions, post them in real time to the production data bases and bring this updated data down again to the personal computer to see the results. With a micro-mainframe link that allows real-time update, he can do this in a few minutes.

Real-time uploads are going to become more common as available products improve. But this evolution should have the user thinking about security in terms of uploads as well as downloads and real-time access to production data bases. Do not expect too much from the mainframe software packages in terms of security. Internal procedures are still going to have to play the major part.

Once an end user has proprietary data on his micro, there is little the mainframe software package can do about security. It is up to you to institute rules like locking offices, enforcing procedures of three generations of back-up on the personal computer files, using data encryption software on the personal computer and insuring the computers and the data. However, personal computer link software can do something about security. Because the links generally treat the micros as terminals, the user should be aware of some of the important options that should be available.

■ Does the package have security at the level of the data base and at the terminal or personal computer? Is there a feature for user identification and user password? Is there security at the record, field or partial field level? These are some of the levels of security that a comprehensive personal computer link software package should have.

■ Can each personal computer be secured by its location, by the time of day and the days of the week that it can access certain data and for periods of time to handle temporary assignments or project situations?

■ A security log is also important. This is a set of records, built by the software, that allows an on-line display of anyone who has been attempting to violate the security system by getting into

unauthorized data and includes information such as which data base and what functions, the personnel and terminal ID and the date and time.

■ Another good feature for security users is providing the ability for the end user to change his own password although not necessarily to add new passwords.

■ Look for the ability to get security interactively in real time. This can be important when a problem employ-

ee has been terminated, and there is a need to eliminate his password before he goes back to his office and does some last-day damage to the system.

Another basic philosophy that should be in the software is the concept of two profiles of users, one each for download and upload. In other words, all of these things should be definable in one way for download or data access but in another way for upload or data update, for

each individual user.

For example, only our financial vice-president has upload and update capability to the budget fields of a general ledger. But each end user can access his own budget data for download purposes.

Look back at the example of the controller updating a mainframe data base. Security features in personal computer links work like this: First, he can only update his defined data base from his defined personal computer,

and he must use his ID and password. Then, he can only get at current amount figures; he only has this capability for a couple of days at the end of the month. The data security function handles the setting of all those security levels.

Being aware of the security risks involved is half the battle. But it is a battle that is easily won when the user supports the new technology with a structured security plan.

Takes their without



The Displayphone-Plus Terminal

SOFTWARE & SERVICES

DESIGN from page 41

requirement changes occur after which the schema and the subschemas are changed. Then the programs in the first and the second subsystems have to be modified or rewritten. When the third subsystem is finally finished, it overruns the inflated estimate by 20%. Why?

The above scenario is by no means fictional. What happens is the time required to complete each subsystem

grows quadratically. This is because the time required to modify each of the previous subsystems is a linear percentage of the initial development effort. As each new subsystem is added, the number of subsystems that has to be modified, as well as the number of interactions, increases.

By using the data base navigation techniques discussed in the accompanying article, the percentage of development time required to

modify the previous subsystems can be greatly reduced. What is also desired is the elimination of the quadratic growth in its entirety. This is achievable if the other subsystems can be insulated from the impact of changes in the data base. The key to providing this insulation is the subschemas.

The process works like this. First of all, do not try to design a data base in the beginning that encompasses all the subsystems anticipated

in the final system. Besides being a futile effort, the reduction in initial system analysis time will make possible earlier delivery on the first subsystem.

Analyze the data requirements and design a data base schema only for the first subsystem. Write and implement the schema and any subschemas that this subsystem requires. Finally, write and implement the programs this subsystem requires using the techniques discussed in the

previous two sections.

When the time comes to build the second subsystem, perform an analysis of its data requirements. If this subsystem is an independent extension of the first subsystem, its data requirements will be an extension of the schema designed for the first subsystem.

Combine the data requirements for the second subsystem with the existing schema for the first subsystem. A large number of the data elements will already exist in the schema for the first subsystem.

Write a new schema for the integrated data requirements. Regenerate the subschemas from the first subsystem to use the new schema. Write the subschemas for the second subsystem. These subschemas should only include the data elements specifically required by the second subsystem.

Finally, write the programs for the second subsystem using the integrated data base.

This process is repeated for each of the succeeding subsystems. The steps to implement each subsystem are the same: Expand the schema, regenerate the subschemas of the previous subsystems to use the new schema, write the subschema for the new subsystems including only the data elements required for that subsystem, and write the programs for the new subsystem using its subschemas.

DEC from page 41

that is said to optimize message delivery. It includes existing standard support for network protocols. The product reportedly gives users the ability to log progress of messages within the network and provides VMSmail gateways for accessing DEC's VMS Personal Mail Utility. Message Router sells for \$4,000 and will be available in the spring, DEC said.

■ Decspell Version 1.1 includes expanded lexicons and compatibility with the All-In-One system. The product reportedly includes correction capability for documents created with the WPS-Plus/VMS. It will be licensed for \$1,850 and will be available in January.

■ Decslide Version 1.3 is said to allow VAX/VMS and MicroVMS users to create slides containing text and graphics. The new version includes compound document capabilities. Decslide is priced at \$2,500 and is available immediately.

■ Decgraph Version 1.3 is a general-purpose graphics package for VAX computers and MicroVMS systems. The product is priced at \$2,500 and is available immediately.

DEC is located at 146 Main St., Maynard, Mass. 01754.

terminal's place the space.

It's important that the Displayphone-Plus* terminal can fit with an existing information management system, offering download emulation of virtually any cursor addressing conversational CRT and plug-and-play compatibility with the VT-100.

But what makes the Displayphone-Plus amazing is that it does it all while still fitting comfortably on a desk.

Inside the Displayphone-Plus terminal is a 212A compatible auto answer modem with selectable 300/1200 BPS transmission rates and full automatic log-on. So it can meet the needs of managers and other occasional data users, while emulating such terminals as the Digital Equipment Corporation

VT-100™ and VT-52™ ADDS Viewpoint® Regent 25, and many more.

On the outside is a full-stroke keyboard and easy-to-read amber screen which allows the Displayphone-Plus terminal to match the performance of large, conventional terminals. Its sophisticated telephone capabilities allow it to surpass them with a 90-number directory, automatic dialing, and handsfree speaking. And it's as easy as a telephone to use.

To find out more about the Displayphone-Plus terminal, call 1-800-328-8500, or write to Northern Telecom Inc., Advanced Communications Terminals Division, P.O. Box 202048, Dallas, TX 75220-9990.

nt northern
telecom



Four-Phase is helping more than 2,000 DP managers win the productivity game. Now it's your turn.

It's easy to win the distributed information processing game when you play it with the Series 4000 from Four-Phase. The Series 4000 is an integrated, growth-oriented system designed to communicate within your IBM environment. No other vendor gives you so many functions for so many years at such affordable prices. In the distributed processing arena, that's the way to score points with both end-users and top management.

You win the DDP game
with software.

Four-Phase provides one of the most impressive and complete collections of software ever offered from one company. Our packages make integrating Four-Phase computers remarkably easy. And guarantee a logical growth path for years to come. Here's just a sample of what we provide:

Interactive processing: VISION® — For creating custom applications from order entry to transaction processing. It provides a high level of functionality that can be used in any distributed environment. And VISION is easier and faster to program than COBOL.

Word processing: FOREWORD® — Our powerful shared-logic word processing system allows text to be entered, stored, edited, distributed and printed.

Graphics — For business graphics, the Graphics Management System (GMS/IV) gives you an easy way to condense and conceptually present data that's easily understood by decision makers.

COBOL — Industry standard COBOL is used to write programs for handling keyboard-entered data and general batch processing.

When they want PC's,
you've got them!

If your end-users are like most these days, they're clamoring for their own personal computers. We play that

MFE

The action starts with the
Multifunction Executive.

The key to the Series 4000 game plan is the Four-Phase Multifunction Executive (MFE). This unique and powerful control program monitors each multifunction terminal in your system. Its ability to run multiple software programs allows your users to perform 16 different tasks from any terminal on the system. And each of your users can access all of our software packages with one keystroke. You get maximum distributed processing capability and control.

Plus, MFE dynamically allocates selected peripherals so that each device can be used by more than one program. The result—MFE eliminates the need for multiple processors, duplicate terminals and other peripheral devices at installations that require concurrent execution of software.

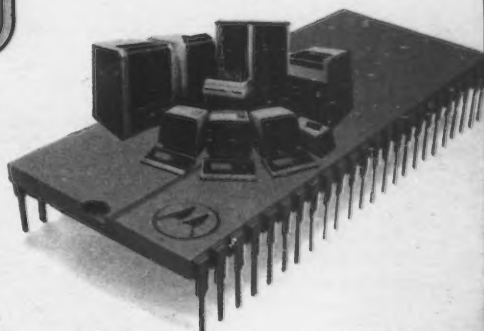
game, too. Because at the flick of a switch, our multifunction terminals suddenly become stand-alone PC's. So now you can give your users the distributed processing capabilities they need, AND the personal computers they want. All in one integrated system.

2,000 winners can't be wrong!

Four-Phase was the first company to introduce the integrated approach to multifunction distributed processing. Today, there are more than 15,000 installed Series 4000 systems, helping people like you manage the information needs of over 150,000 end-users. And every machine is backed by our Customer Support Operation and over 1,000 field service people to provide continuing support and reliability at every level.

Four-Phase customers have been winning the DDP game for years. You can, too. To find out how, call us today at 1-800-528-6050, ext. 1599. In Arizona, call 1-800-352-0458, ext. 1599. For a free poster of this illustration, write to us at 10700 North De Anza Blvd., M/S 52-6A9, Dept. P., Cupertino, CA 95014.

VISION, FOREWORD and Multifunction Executive are registered trademarks of Four-Phase Systems, Inc. MOTOROLA and © are registered trademarks of Motorola, Inc. Four-Phase and the Four-Phase logotype are registered trademarks of Four-Phase Systems, Inc. GMS/IV is a trademark of Four-Phase Systems, Inc.



MOTOROLA
Four-Phase Systems

FOUR LITTLE WORDS THAT STRIKE FEAR IN THE HEARTS OF BROKERS



"The computer is down."

It is ironic that when we become dependent on computers, we are at their mercy. As more and more companies go on line, the industry reliability standard of 98.5% becomes unacceptable because it means your computer is liable to go down once every two weeks, on a statistical average.

So, if you are a broker, banker, manufacturer, or businessman who relies on your computer more and more, take note: Stratus Computers are designed not to fail; not once every two weeks, or once every 200 weeks, or once every 2,000 weeks!

Debunking The Myth That All Fault Tolerant Computers Cost More.

It is a common and reasonable assumption that because there is redundancy (extra programming, or extra components) in fault tolerant computers, that makes them cost more. Where the

	STRATUS XA400	IBM 4381	HP 3000 68	DEC VAX-11/782
RELATIVE PERFORMANCE*	125	100	64	109
PRICE	\$446,350	\$707,897	\$437,754	\$656,889
PRICE PERFORMANCE	\$ 3,571	\$ 7,079	\$ 6,840	\$ 5,999

Relative Price Performance Index
*Computerworld, August 20, 1984

All systems are comparably configured with identical amounts of memory, disk space, and communication lines. But, only the Stratus price includes fault tolerance.

redundancy is in expensive software, this is true. But Stratus has hardware-based fault tolerance that takes advantage of the extraordinary advances in chip technology. The result - price drops. The fact of the matter is, our hardware redundancy adds a mere fraction to our cost, and absolutely nothing to your purchase price. What's more, in overall price/performance comparisons against the top computer names, including IBM, DEC, and Hewlett Packard, Stratus was at the front of the pack, despite the fact that it included fault tolerance, while the others didn't.

Why Stratus May Be The Best Computer For The Times, For The Money.

Considering its showing in overall price/performance comparisons against the most successful computers, Stratus must be considered. And when you take into account the added

efficiency and security of fault tolerance, and the fact that it is the world's most powerful fault tolerant transaction processing computer, Stratus truly becomes impossible to ignore. In the 1980's Stratus simply is the right computer, at the right price. For information, contact your local Stratus sales office, or call Keith Johnson in Massachusetts at (617) 460-2188, or toll-free at 1-800-752-4826.

Stratus

CONTINUOUS PROCESSING™

Now that the world relies on computers it needs a computer it can rely on.

COMMUNICATIONS

Dual-port muxes help users cope with cable woes

By Jeffery Beeler
CW West Coast Bureau

SAN FRANCISCO — Members of the San Francisco Police Department's Gang Task Force were beginning to get a little edgy.

For some time, the task force had sought to install an IBM 3287 printer in its fifth-floor, downtown administrative control center. The printer was earmarked to be located with an existing CRT terminal that the police use to receive administrative messages from around the state.

But the installation, though seemingly routine, hit a snag: Because the task force lacked the necessary coaxial cable, it was unable to connect the newly acquired printer to its existing hardware.

So the police approached the city's Department of Public Works (DPW) and asked that an additional coaxial cable be strung between their first-floor IBM 3274 controller and the printer. But the DPW, with its job order backlog already lengthy, was unable to respond promptly.

In fact, the delay in pulling the desired coaxial cable probably would have ranged from one to two months, according to John Barr, DP manager at the City of San Francisco's Hall of Justice.

News of the extended lead time reached the local police chief, whose reaction was less than sympathetic. Police Sgt. Bill Shoaf explained that the chief, in a memo to the Gang Task Force, said, in effect, "I know there are a hundred reasons why you can't do it. Just get it done."

One day later, a task force member spied a newspaper ad extolling the virtues of a modest-looking communications accessory that allows two I/O devices to be run from the same coaxial cable. The accessories, dual-port coaxial multiplexers, were developed by Fibronics International, Inc., a Hyannis, Mass.-based fiber-optics communications company.

Intrigued and desperate, the task force decided to try the coaxial doublers. Within 15 minutes of their arrival, two were fully installed and were allowing a shared coaxial cable to support both the IBM printer and its companion terminal, Barr recalled.

See **DOUBLERS** page 56

Southwestern Bell to expand digital transmission services

ST. LOUIS — Southwestern Bell Telephone Co., noting that a third of the customers who are bypassing the company do not know that it offers services they need, has announced a series of digital transmission services.

Tariffs for some of the Digital Link Services, including Megalink and Microlink, will be filed in Kansas, Arkansas, Oklahoma, Missouri and Texas in the next several months and in other states in 1986, according to the Southwestern Bell Corp. subsidiary.

"Our own research indicates that about a third of the customers who bypassed us didn't know we could have provided the network services they needed. Too many customers think we only provide plain old phone service."

"But our business is moving information — voice, data and video," said James W. Callaway, vice-president of marketing for Southwestern Bell Telephone.

Callaway said digital transmission throughout the region will be enhanced by installation within the next two years of at least 32 new digital switching systems serving up to 450,000 customer lines. The company now has 27 digital switching systems serving 95,000 lines.

Dedicated data lines

The Megalink services, designed for cus-

tomers needing dedicated data lines, include Megalink I-Standard Digital Service, Megalink II-Premium Digital Service and Megalink III-Wideband Digital Service/1.54Mbps.

Megalink I and Megalink II, the latter of which is currently offered under the name of Dataphone Digital Service, offer transmission speeds up to 56K bit/sec. Megalink II will feature 24-hour monitoring and 99.5% accuracy, according to the company.

Megalink III, featuring a 1.54M bit/sec transmission rate, was designed for high volumes of data, voice, video, electronic mail, facsimile and other services.

Microlink I-Public Switched Digital Service and Microlink II-Packet-Switched Digital Service are targeted at businesses and residential customers who transmit data less frequently.

Microlink I provides dial-up digital transmission on the established telephone network using a digital link between the computer and telephone line.

The tariffs for that service will be filed in 1986.

Microlink II will allow various customers to transmit packets over the same lines and save money by only paying for their own usage.

The Microlink II tariffs will be filed in 1985.

Tymnet plans Japanese net

SAN JOSE, Calif. — Tymnet, Inc. has announced a joint venture that it hopes will lead to the establishment of a value-added network throughout Japan.

Tymnet, a packet-switching network, said the joint venture with the Tokyo-based Marubeni trading company will become effective April 1, when the firms expect approval of a proposed telecommunications bill in the Japanese parliament that would allow private companies to offer value-added network services.

A Tymnet spokesman said that all of the value-added services that Tymnet offers in the U.S. will be available through

the Japanese network.

Much hardware, software installed

The spokesman said the venture, Japan Network Ltd., will use Tymnet hardware and software, much of which already has been installed.

The network initially will support the cities of Osaka, Tokyo, Sendai, Nagoya, Fukui, Kanazawa and Toyama.

It also will connect to the Tymnet network in the U.S. and other worldwide public data networks, according to Tymnet.

There are 22 secondary shareholders in the joint venture.

Reagan position on Intelsat competition may be moot



DATA STREAM
James Connolly
CW Senior Editor

The Reagan administration's approval of limited private competition for the International Telecommunications Satellite Organization (Intelsat) may be good news for Intelsat's potential rivals.

But the president's action may have little influence on what already seemed to be developing as a buyer's market in international communications. Even before the president issued his memorandum to the secretaries of state and commerce, communications industry observers were predicting drastic price cuts for intercontinental traffic because Intelsat overestimated demand for its transponder space, and terrestrial transmissions are increasingly available as an option.

The administration said it will allow the five private rivals of Intelsat to fight for up to 15% of Intelsat's U.S.-based data, video and intracompany voice traffic. Those rivals are Orion Satellite Corp.; International Satellite, Inc.; Pan American Satellite Corp.; Cygnus Satellite Corp.; and RCA Americom, a subsidiary of RCA Corp.

Unanswered question

However, one question that remains unanswered is how soon, and under what conditions, those companies that last year asked the Federal Communications Commission for permission to compete with Intelsat can get into the satellite market. Reagan said that those who compete with Intelsat must consult with Intelsat about their plans, that they cannot offer switched public circuits and that they must meet the technical compatibility standards of regulating bodies in the countries they plan to service.

Fritz Ringling, director of telecommunications research for the Gartner Group, Inc. in Stamford, Conn., speculated that RCA and Orion are most serious about offering satellite services.

"I anticipated that the administration would allow private satellite companies to compete with Intelsat. I also anticipate very aggressive pricing strategies, which could mean significant savings for customers," Ringling said.

Ringling said one reason for the lower prices is the current and future lack of demand for transponder space. He said Intelsat overestimated the need for circuits by 15%, "which translates into 12,000 voice-grade circuits." He observed that even the National Aeronautics and Space Administration has predicted a 10.3% decline in the growth of full-time satellite traffic. He added that the U.S. International Service Carriers last year revised downward their estimates for satellite

See **INTELSAT** page 56

INSIDE

Controllers/56

FINALLY. HELP FOR THE DATA CRAZED.

**Introducing Cypress[®], Cedar[™], and Juniper[™].
Three fast, friendly, infinitely applicable
desktop ideas from ROLM.**

It comes as no surprise that people react to technology differently. Dyed-in-the-chip techies thrive on it. True non-believers avoid it instinctively.

Now you can please all of the people all of the time. Honest.

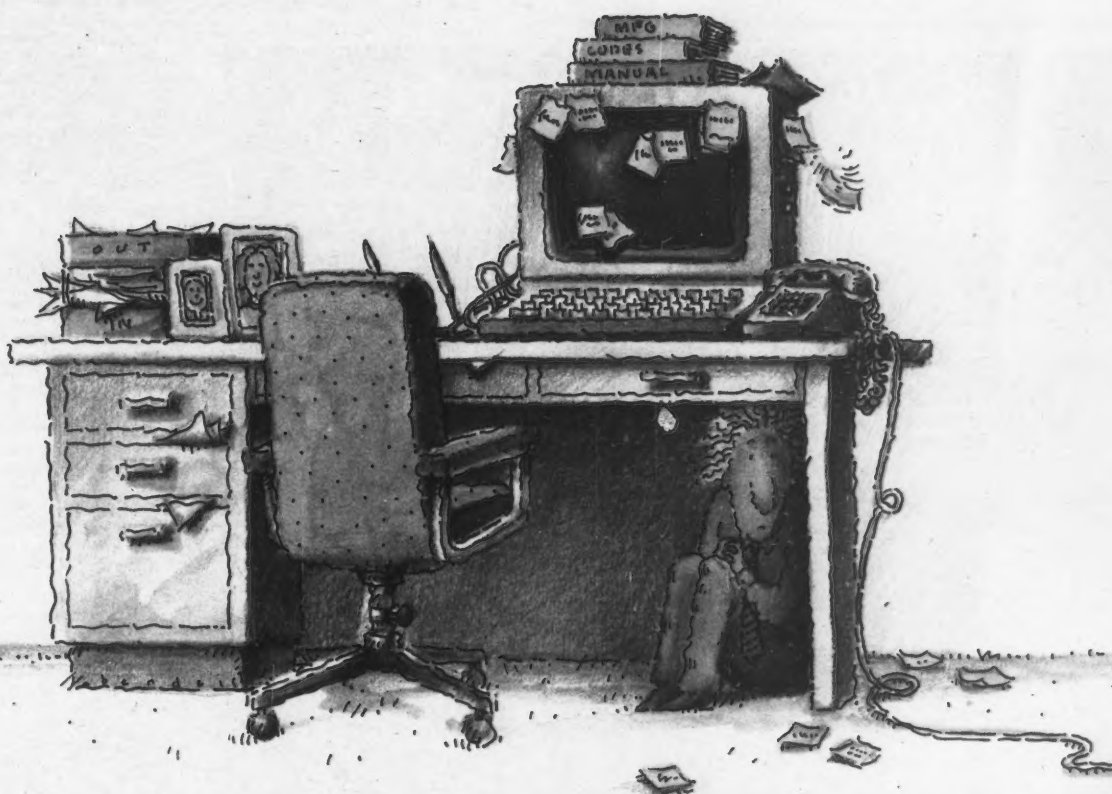
Say goodbye to complicated log-on codes. Just push a button

and — whoosh! — travel all the way to a data base, talk to a mini or access your IBM mainframe.

Say hello to speakerphones, phone books, message takers and calculators. Built right in.

If you want to take snapshots of data in your mainframe, there's Cypress. It's as easy as Point & Shoot. It's a smart little ASCII terminal integrated with a fully-featured digital phone.





Need a 512 KB, fully IBM-compatible PC that runs programs like pfs:graph,[™] the IBM Assistant Series,[™] 1-2-3,[™] and lets you mini-network through your phone line? Cedar's the one.

Already in love with your IBM[®] PC or XT but crave the affections of Cypress? Ask for Juniper. Its one slot adaptor card lets your system keep growing. And growing.

Of course, only ROLM has Cypress, Cedar and Juniper. Because only ROLM has the sys-

tem to run them on. At its heart is the CBX II, a breakthrough communications controller that manages voice and data over standard telephone wire. Simply, brilliantly and cost effectively.

And ROLM has the technical edge, the operational track record and the worldwide service and support organization to please even the toughest customer.

So phone ROLM. High tech. Not high anxiety.

ROLM

4900 Old Ironsides Drive, M/S 626 Santa Clara, CA 95050 • 800-538-8154. (In Alaska, California and Hawaii, call 408-986-3025.)

Trademarks: pfs:graph—Software Publishing Co., IBM Assistant Series—International Business Machines Corp., 1-2-3—Lotus Development Corp.

CONVERTING TO IBM?

Based on previous success and popular demand, Touche Ross & Co. is hosting another conference for companies converting from non-IBM computer environments to IBM.

The purpose of the conference is to provide a forum for participating companies to exchange ideas and share experience. All participating companies will be asked to make informal presentations and participate in breakout groups. Touche Ross will act as conference host and moderator.

QUALIFYING CRITERIA

- MVS target operating systems only
- Must have **already** made decision to convert
- Attendance of principal MIS management individuals required

For further information contact:

Harry E. Bennett, Partner
Touche Ross & Co.
1200 Smith Street
Houston, Texas 77002
(713) 651-9581
Telex 791-010

COMMUNICATIONS

CONTROLLERS

EMULEX CORP. Commxchange

Emulex Corp. has announced a data switch that is said to allow connection of 180 terminals to single- or multiple-host computer networks.

Commxchange, also called the DS01, reportedly supports 180 terminal-to-computer port connections, or 360 lines, and can be expanded for an additional 480 connections, or 960 lines.

According to the vendor, the Commxchange is compatible with virtually any type of computer or asynchronous terminal, and performance is unaffected as the number of users increases.

The basic system includes a cen-

tral unit, power supply and central board set. The backplane reportedly is fully redundant, while redundant central boards, expansion bus boards and power supplies can be added as options. It also features a standard battery backup to ensure saving configuration parameters in the event of a power failure.

The company said installation can be handled by a maintenance department or telephone installation crew. It connects through ordinary telephone lines and connectors using a variety of methods, such as telephone punch blocks, telephone jacks, 50-pin connectors and RS-232 distribution panels.

A supervisory control board in the central unit provides menu-driven software for step-by-step instructions on routing terminal lines to designated computers, according to Emulex. A terminal reportedly can select any of 45 types of destinations by using eight-character symbolic names or specific line numbers.

The unit is said to support speeds up to 9.6K bit/sec on all lines.

The company said a typical unit, with redundant power supplies and board sets, costs \$15,000.

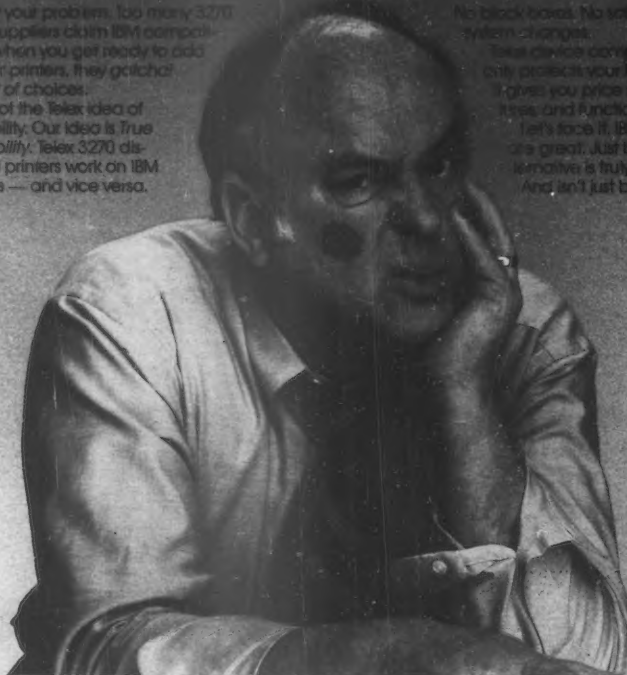
Emulex, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

CAN YOU DISTINGUISH TRUE COMPATIBILITY FROM JUST BEING FRIENDS?

We know your problem. Too many 3270 terminal suppliers claim IBM compatibility. But when you get ready to add displays or printers, they glitch! You're out of choices.

That's not the Telex idea of compatibility. Our idea is True Compatibility. Telex 3270 displays and printers work on IBM controllers — and vice versa.

No black boxes. No workarounds. System changes. Total device compatibility not only protects your IBM investment, it gives you price savings, features and functions beyond IBM. Let's face it, IBM alternatives are great. Just be sure your alternative is truly compatible. And isn't just being friendly.



TELEX 3270 ALTERNATIVES

► IBM INTERCHANGEABLE

WE GIVE YOU THE POWER TO CHOOSE.

TELEX. The innovation continues...



Telex Computer Products, Inc. 6422 E. 41st Street Tulsa, Oklahoma 74135 (918) 627-1111
Regional Sales Office Cherry Hill, NJ (609) 665-8066 • New York, NY (212) 599-7220 • Southfield, MI (313) 358-1195
• Atlanta, GA (404) 955-7745 • Rosemont, IL (312) 298-9800 • Garden Grove, CA (714) 898-9833
• Federal Marketing Springfield, VA (703) 922-9333 • Canada Willowdale, Ontario (416) 494-4444
• International Norwood, MA (617) 762-6700

DOUBLERS from page 53

The Gang Task Force's recent case history is by no means unique, according to Fibronics product manager Dave Sonderegger. He said that in hundreds of large businesses and other organizations throughout the U.S., dual-port coaxial multiplexers are providing users with a quick-fix alternative to the often costly and time-consuming practice of installing additional cable.

The motivation for installing the communications accessories varies widely.

Some users — the San Francisco Police Department's Gang Task Force, for example — opt for the devices to avoid lengthy delays in pulling coaxial cable. Other users, including the I Magnin department store chain, see the multiplexers as a means of minimizing their hardware overhead.

Installation of a single coaxial cable frequently costs \$1,000 to \$1,200, according to Roy Dodd, the chain's operating vice-president for MIS. Two doublers, by contrast, sell for less than \$500.

INTELSAT from page 53

lite circuit demand and that he won't be surprised if they reduce their figures yet again.

While demand is waning, the customer's cost for satellite transmissions also will come down, which could inspire new business applications, according to Ringling and other observers. Ringling noted that the price of earth stations, particularly receive-only stations, is plummeting.

Jerry Lucas, president of the Telestrategies, Inc. consulting group in McLean, Va., predicted that opening up more transponder space, in particular transponders on the underutilized Ku Band, will lead to large companies developing new applications for their satellite links. He said one such application would be downloading software updates to multiple locations around the world.

INVEST IN THE BEST

SAVE TIME & MONEY
WHEN YOU SUBSCRIBE TO

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

\$9.00 a copy \$44.00 a year

ENTER 1234

VOL. 10, NO. 25

~~\$44.00~~ \$39.00

As a weekly newspaper COMPUTERWORLD gives you thorough and timely coverage of news and ideas to computer users. Unlike monthlies, COMPUTERWORLD covers hundreds of relevant news items each week. But beyond the "news" you get much more: weekly "In-Depth" articles, monthly "Special Reports" on selected topics, special focus issues and more.

With this order form, you pay only \$39.00 (just 76¢ a week). That's a \$5.00 savings off the annual rate. So, invest in the best, subscribe today!

Complete this form and mail in the postage-paid envelope or use your charge card and call; toll-free: 1-800-343-5730.

NAME _____

COMPANY _____

COMPUTERWORLD
10000 W. 10th Ave.
Denver, CO 80202

Please send me **COMPUTERWORLD** for one year. **RATES: United States \$44;**
Canada, Central & South America \$110; Europe \$165;
All Other Countries \$245 (Airmail Service)

Special introductory offer
Only \$39.00 Save \$5.00

☐ Check Enclosed ☐ BA/Visa ☐ MC ☐ Am Ex ☐ I/MC Only List four digits above your name

Expiration Date _____

If charge we must have cardholder's signature _____

First Initial	Middle Initial	Surname
Your Title		
Company Name		
Address		
City	State	Zip Code

Address shown is: ☐ Business ☐ Home
☐ Check here if you do not wish to receive promotional mail from **Computerworld**.
☐ Check here if you're interested in receiving information on **Computerworld's** Index.

I'm already a subscriber, but I'd like you to change my:
☐ address ☐ industry ☐ title ☐ other

Put old label or label information here—
and new information above.

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

CIRCULATION DEPT., 375 Cochituate Road, Rte. 30, Box 897, Framingham, MA 01701-9985

Detach here, moisten and seal envelope securely before mailing.

BUSINESS INDUSTRY (Circle One)

- End Users**
10 Manufacturer (other than computer)
11 Manufacturer (computer)
12 Manufacturer (software)
13 Manufacturer (hardware)
14 Manufacturer (peripherals)
15 Manufacturer (services)
16 Wholesale/Retail Trade
17 Business Service (except DP)
18 Government—State/Federal/Local
19 Military/Communications Systems/Terrestrial
20 Mining/Construction/Petroleum/Refining
21 Other User

- System**
22 Manufacturer of Computers, Computer-related Systems or Peripherals
23 Computer Service Bureau/Software/Planning/Consulting
24 Computer Peripheral Dealer/Distributor/Retailer
25 Other

2. OCCUPATION FUNCTION (Circle One)

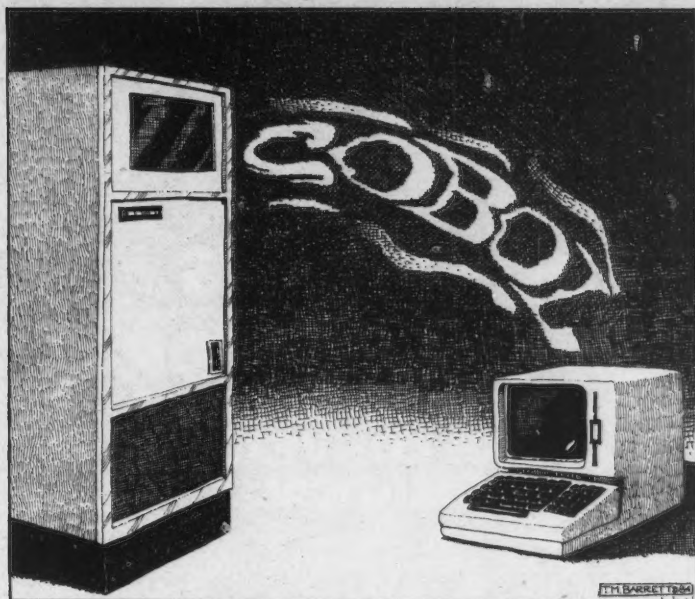
- 11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Financial Officer
14 Director/Manager of Operations/Planning/Services
15 Director/Manager of Operations/Planning/Administrative Services
16 Systems Manager/Systems Analyst
17 Manager/Supervisor/Team Leader
18 Programmer/Analyst
19 Data Comm Network/Systems Supervisor
20 Data Comm Network/Systems Mgrt
21 Mgr Software/Hardware Tech Mgmt
22 Mgr Software/Hardware Marketing Mgmt
23 Consulting Mgrt
24 Medical/Legal/Accounting Mgrt
25 Educator/Journalist/Librarian/Student
26 Other

3. COMPUTER INDEPENDENT (Circle One)

- A. Mainframes/Supremas
B. Minicomputers/Small Business Computers
C. Microcomputers/Personal Computers
D. Communications Systems
E. Office Automation Systems

IN DEPTH

WARNING



To anyone moving Cobol applications to micros

RESPONSE

The In Depth article "Running your Cobol on micros" by Anthony Fedanzo Jr. [CW, Nov. 19] presented arguments for converting existing mainframe or mini applications to micros. Here are some caveats from a reader who has run Cobol on micros for the last four years.

By Dick Burkhalter

I am not one of the "Cobol haters" who think that Cobol and Cobol programmers should be banished from the planet. Nor am I of the opposite persuasion, praising Cobol above all other languages. I simply view Cobol as another computer language with its own strengths and weaknesses.

My experience with Cobol on micros is limited to a single product, Ryan-McFarland Corp.'s Cobol compiler. It may be that some of the problems I mention are specific to that particular implementation, and I think it would be valuable to readers to hear from users of other Cobol compilers, such as those from Micro Focus, Inc., Microsoft Corp., Realia, Inc. and others.

I found Fedanzo's article interesting and informative. I do, however, think that he missed some key points (or glossed over them) in relation to the difficulties that might be encountered in moving a Cobol application from

a large computer to a micro. I am concerned that readers without extensive personal computer experience may be misled by the article, which portrays the conversion as a relatively simple one.

The problems that may occur in moving Cobol applications fall into four general categories:

1. Problems associated with the incompatibilities in the various implementations of Cobol.
2. Problems caused by the quality of the original Cobol code or efforts to clean it up.
3. Problems resulting from the limitations of microcomputers.
4. Problems in transferring data between mainframes and micros.

Unless you already use Ryan-McFarland's Cobol or Information Processing, Inc.'s Blis/Cobol on your large machine, you cannot get a truly compatible Cobol compiler for your micro, as far as I know. Even with these two products, there may be some differences in implementation that will necessitate rewrites of part



DOS TO MVS

CA-CONVERTOR™

THE COMPLETE SYSTEM FOR TRUE CONVERSION AUTOMATICALLY

The best software conversion system will take you from DOS to MVS with less pain, greater speed and the most savings. It's CA-CONVERTOR.

It will convert DOS JCL to MVS JCL. *Automatically.* It will convert DOS programs to MVS programs. *Automatically.* And it will create complete MVS documentation. *Automatically.*

CA-CONVERTOR will manage the migration process. It starts by inventorying and cataloging every DOS program. *Automatically,* you'll discover programs long forgotten and no longer needed. It provides up-to-the-minute reports throughout the process. *Automatically,* you retain control.

CA-CONVERTOR delivers true MVS conversion, not emulation for which you pay forever in higher core requirements and extra machine time.

With CA-CONVERTOR, you pay only for what you use—a piece at a time—and when you're finished using, you're finished paying.

CA-CONVERTOR, formerly known as FOCUS, is now available from Computer Associates. It's been proven in hundreds of the most effective conversions ever made. So now, Computer Associates provides even more software solutions—for the worlds of DOS and MVS and the migration between. For a free DOS to MVS Conversion Handbook or further information, call (800) 645-3003 or in NY (516) 333-6700 and ask for Dana Williams.

WHAT WE BELIEVE

**AS THE MOST DIVERSIFIED SYSTEMS SOFTWARE COMPANY
IN THE WORLD—MORE DOS PRODUCTS AND MORE MVS PRODUCTS
INSTALLED IN MORE DATA CENTERS—WE, COMPUTER ASSOCIATES,
BELIEVE WE ALONE CAN SATISFY ALL OF A CLIENT'S NEEDS.**



COMPUTER ASSOCIATES

Software Leadership Through Excellence

©1994 Computer Associates International, Inc. All rights reserved. Product 147-11751

IN DEPTH/COBOL ON MICROS

of your original source code. This is the best case. In the worst case, you may have to rewrite so much of the code that you might as well start from scratch.

Those of you in IBM mainframe environments have a real bear of a problem, because no matter which personal computer Cobol you pick, you may have to rewrite significant portions of the code in transporting it to a personal computer. Yes, I know, all the microcomputer Cobol vendors claim conformance to the Ansi '74 standard, and as far as I can tell, they aren't lying.

However, the standard has a lot of levels, and only in the fine print do you find out what each vendor supports at each level. And, of course, IBM is well known for its own extensions to Cobol, such as Sort and Report Writer. You don't use those? Lucky for you. Maybe.

Fedanzo stated that the most likely candidates for migration to microcomputers are those older batch programs that are used for data entry. Fine. But micros, by definition, are on-line, interactive machines, getting their input from the screen rather than from cards, tapes or whatever. Most old data entry programs I have seen read cards or card images, and the coding necessary to change to screen input is not as trivial as you might first believe, especially if you are going to edit interactively and prompt the operator.

Screen handling

Even if the programs you are converting use screen input, you need to consider the differences in screen handling between your mainframe compiler and whatever product you choose for the micro. If you have an IBM system and use CICS, you can probably expect to throw away about 60% of the code right off the bat. Similar, though perhaps less burdensome, differences will hold true for other mainframe and mini-computer users.

If your mainframe or mini uses a later version of Cobol that supports such nice features as SEARCH, SEARCH ALL, STRING, UNSTRING and other newer verbs, you are going to have to spend a significant amount of time developing subroutines to replace those features, none of which are present in current personal computer Cobol compilers.

Fedanzo recommended making program changes on the mainframe rather than on the personal computer, supposedly to take advantage of the higher speed of processing and better editing facilities inherent in large computers. I dispute that assumption, especially in a large shop with a heavily loaded system.

Using Micropro International Corp.'s Wordstar or any other word processor, a dedicated personal computer can run circles around most mainframe editors, considering the poor response time usually found on large systems during peak hours. Not only that, but the programs must be compiled on the personal computer anyway, so time gained, if any, by editing on the mainframe may be lost in downloading to the personal computer for compilation.

Speaking of compilation, one should be aware of the slowness of compile times on personal computers relative to mainframes. A typical Cobol program on a mainframe might average 2,000 to 3,000 lines of code and compile in less than a minute. In

Those of you in IBM mainframe environments have a real bear of a problem, because no matter which personal computer Cobol you pick, you may have to rewrite significant portions of the code in transporting it to a personal computer.

contrast, the compile time on a micro would be measured in portions of an hour or even more. A program this large is truly huge by personal computer standards.

I have a system written in Cobol for a Tandy Corp. TRS-80 Model III. It contains about 40 programs, the smallest of which is less than 200 lines of code and the largest about 1,800 lines, with an average program

size of 500 to 600 lines. The small programs compile in three to five minutes, depending on whether I print the source listing during compilation. The larger ones seem to take time, which increases exponentially with the size of the program; that one real biggie takes more than 45 minutes!

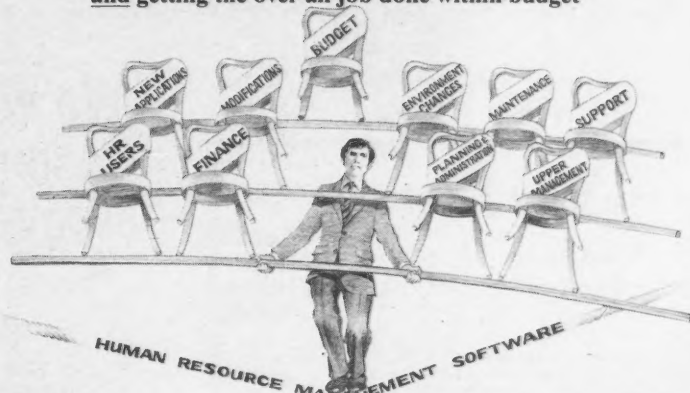
Granted, substantial speed improvements will be experienced with

16-bit machines as opposed to the TRS-80's 8-bit processor, but you will still encounter long compile times as the programs increase in size. You cannot compile programs on the mainframe and move only the object code to the personal computer, because the instruction sets and form of the object code are machine-dependent.

Which brings me to yet another trap for the unwary, namely that of the differences in those supposedly "compatible" personal computers. If you have a mix of personal computer brands, which you intend to use as target machines, be absolutely sure that a single copy of the compiler will create usable object code for all of them. It's possible, but be sure to find that out via actual testing before you embark on a large project, or you may find yourself facing

When it comes to the demand for human resource management software, data processing has a problem...

A problem of balancing everyone's needs and getting the over-all job done within budget



Now what if...

- There were 4 software packages that fully integrated to meet all your human resource management needs in payroll, personnel, benefit plan, and claims processing programs.
- And these packages were completely on-line, realtime, and adaptable to meet your ever-changing business requirements
- And this adaptation, including small and major modifications, was done by the user by modifying entries in the tables that define program logic, data structures, etc.
- And these packages operated with all major DBMS' and TP systems common to IBM and IBM compatible mainframe environments
- And these packages could quickly adapt to new environmental offerings such as IBM's DB2

- And the company who authored these packages provided thorough maintenance, training, and user support to assure user independence
- And the cost of all this was much less than in-house development, support, and maintenance...

Now what if you had all of this?

Then you'd have Tesseract's complete line of Human Resource Management software.

You'd have systems that are being used by almost half of North America's largest companies.

And you'd finally have the solution to the never ending problem of balancing HR user needs with the needs of the rest of your organization.

STOP WALKING THE HUMAN RESOURCE MANAGEMENT TIGHT-ROPE. Call us today or send in the card. (Call 415-543-9320 and ask for Robin Curle, VP Sales)

Mail to: Tesseract, 101 Howard Street San Francisco, CA 94105	
Name/Title _____	
Company Name _____	
Company Address _____	
City _____	State _____ ZIP _____
Phone () _____	
Type of Business _____	
Number of Employees _____	
Computer in Use _____	
Send info on: <input type="checkbox"/> Personnel Management System <input type="checkbox"/> Payroll System	
<input type="checkbox"/> Benefit Plan Administration System	
<input type="checkbox"/> Claims Processing System	
BS NAT 1 CW	

TESSERACT

Software that creates solutions, not problems.

IN DEPTH/COBOL ON MICROS

unexpected expenses for extra cross-linkers.

In the case of the TRS-80 system, separate compilations are required for the Model III and Model I versions, even though the two computers are from the same manufacturer and use the same Zilog, Inc. Z80 CPU. Fortunately, the Cobol compiler package from Tandy (RM Cobol) includes disks for both the Model I and Model III.

If, however, I wish to upgrade my system to run on the Tandy Model 16 or 2000, I will have to purchase a different Cobol compiler for each of these two machines, because they are not compatible with the Model III or with each other.

Quality of Cobol code

One of the most significant issues to be considered is the quality of the programs to be converted. Given that most of the ideal candidates for conversion are likely to be older batch programs written at the Cobol-74 level, it is highly unlikely that these programs were written in structured code.

Moving unstructured code from a mainframe to a personal computer will only move the maintenance headaches from one environment to another, and the latter may be less efficient in terms of maintenance facilities.

If modifying the transported code is to be considered in order to bring about conformance to current structured programming standards, significant delays may be expected. Missing or misleading documentation

is common with older programs, and making modifications without totally "gut-ripping" the programs can be difficult. We all know the feelings of frustration that come from wanting to scrap an old program but being forced to make the best of it because of time and cost considerations.

Either way, it is an expensive game to play.

Limitations of micros

Fedanzo mentioned the limitation of 64K bytes of data stack space, which relates to the length of the longest program you may have in memory at a time. This is by far the least restrictive limitation you need be concerned with, because it is often possible to divide a large program into segments or modules that can be called from one another. In some cases, even this technique does not work, however, as portions of the data division that are passed from module to module remain in memory, and eventually you run out of memory, just as in Basic or any other language.

Because you find out about this at development time, during testing, it's not as crucial as finding out after you have put the program into production mode, but the amount of time you have to spend fixing up programs to run in less memory is something to be anticipated.

Another problem here is that you have no way of knowing in advance how much memory a mainframe program will take on a personal computer, because there is no direct correspondence between the size of the

program as it runs on your large system and the amount of space it will take when moved over to your micro. You just have to use common sense and try it. (Obviously, you aren't going to try fitting that 20,000-line payroll program into your micro, are you?)

If fitting programs in memory and waiting for compilers to finish are small problems, then fitting all that code onto floppy disks can be a real nightmare. The average personal computer has about 350K to 400K bytes of storage per double-sided, double-density floppy disk. That's not very much storage from the point of view of most mainframe applications. Cobol programs are notoriously verbose and, even at the object-code level, can require more space than is available on a single floppy drive.

Remember, you not only need to have all your programs on a single disk, but that disk must also contain the Cobol runtime modules and the operating system as well. Consideration must be given to this limitation, lest you find yourself in a situation in which the operator is forced to swap program disks in order to run the application — definitely not a user-friendly situation!

Similarly, data files on large systems tend to occupy a lot of space (in personal computer terms). Even if you can segment these files for downloading, you must be aware of your total disk space needs. I can't think of anything much worse than having an "out of disk space" message occur in the middle of a hectic

day. Don't laugh, I've had it happen, and so may you, as Murphy's Law reigns supreme in this business.

As far as I'm concerned, hard disk is the only way to go, and the more the better in the corporate environment. This is true regardless of the language being used. The declining cost of hard-disk storage makes this point even more valid. And while you're at it, factor in the cost of a streaming tape backup, because we all know that if the operator has to back up the hard drive to floppies, sitting there feeding backup disks into the personal computer, one by one, backups will be skipped with regularity. (They usually will be taken only on the day after a power failure wipes out all the data captured since the last backup, which may have been weeks earlier.)

Add the price of at least 10M bytes of hard disk and a compatible tape backup device per target machine to your conversion cost.

Data format incompatibilities

Regardless of how easy or difficult it may be to convert program code, you must be aware that the data format incompatibilities between mainframes and micros present a bigger burden than Fedanzo suggested. Moving source code files presents no special problems, because these are simply Ascii text files.

However, there is currently no way to transfer random or indexed files directly (and what good is a Cobol program if it doesn't use Isam files?). Programs will have to be

Get the Most out of SAS®

through AppTech's Comprehensive Training Seminars

Until now, there has never been a single course specifically designed to allow programmers and technical users to get the most out of SAS.

AppTech seminars provide step by step, progressive instruction in:

- Reading data from simple through complex (such as VSAM files) sources
- Producing sophisticated management reports in chart, graph, plot and columnar form
- SAS utilities
- An introduction to the SAS Macro Language

Dates and Locations

Washington, DC - January 28 to February 1
Houston, TX - February 25 to March 1
Los Angeles, CA - March 18 to 22
New York, NY - April 1 to 5
Chicago, IL - April 15 to 19

Additionally, on-site courses which address specific business applications are available. Applications offered include:

Payroll	Manufacturing
Banking	Finance (Accounting)
Insurance	

For more information on this unique approach to SAS education, contact:

APPTech, Inc.
Suite 100, Dept. C
9 North Third Street
Warrenton, VA 22186 (703) 347-2522

SAS® is a registered trademark of SAS Institute, Inc., Cary, NC

We've got the Swedish computer community covered. Have you?



In 1982, sales of computer hardware, software and services reached \$1.2 billion in Sweden. This market is expected to grow at an annual rate of 18% with the government and manufacturing industry being most effected.

And now our new sister publication, *Computer Sweden*, can bring your advertising message to

20,000 professionals in this expanding marketplace. *Computer Sweden* is published bi-weekly in a tabloid format and will bring *Computerworld's* high standards and editorial quality to the Swedish computer community.

Its circulation includes managers, marketing directors, engineering management at computer hardware, software and service suppliers, educators, consultants, DP managers and technicians.

CW International Marketing Services is your one-stop advertising service in countries around the computer world. For more information about *Computer Sweden* or any of our other foreign publications, just fill out the coupon below.

Diana La Muraglia
Manager, International Marketing Services
CW COMMUNICATIONS, INC.

375 Cochituate Road, Box 880, Framingham, MA 01701
(617) 879-0700

Please send me more information on:

☐ Computer Sweden

☐ Your other foreign publications

Name _____ Title _____

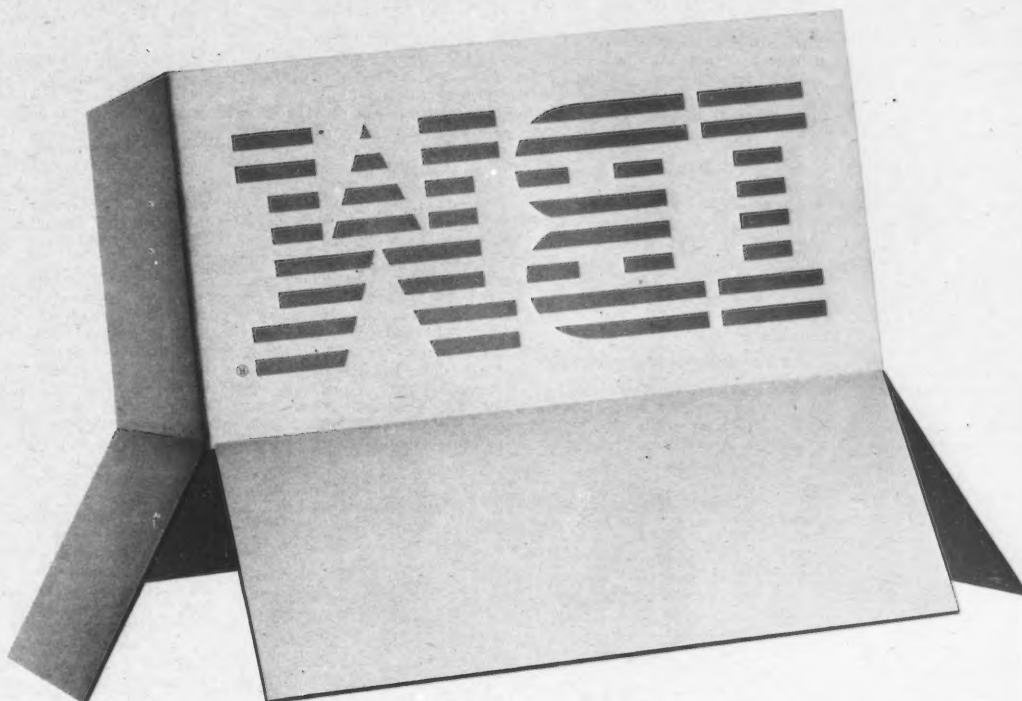
Company _____

Address _____

City _____ State _____ Zip _____



CW COMMUNICATIONS, INC.
Publishers of *Computerworld* and other leading computer publications around the world.



Compared to Data General's desktop, the IBM PC-AT seems a little empty.

If you need a networked multi-user micro system today, there's no comparison.

Data General's DESKTOP GENERATION™ has delivered for over a year the multi-user applications that the IBM PC-AT only promises.

What can Data General deliver today? Distributed data processing. Connectability to other vendors' equipment, including IBM mainframes. Fully integrated office automation, using our CEO® systems.

Can you get all this from the IBM PC-AT?

It's anyone's guess when the IBM PC-AT will have all the capabilities Data General's DESKTOP GENERATION gives you now. So in today's business battle, don't get caught using yesterday's technology.

Choose Data General. And choose productivity over promises. For more information, call 1-800-DATAGEN.

*Depending on application.

Chart based on trade press articles, IBM literature, industry reporting publications and data supplied by industry reporting sources.


The IBM logo is a registered trademark of International Business Machines Corporation. CEO is a registered trademark, and DESKTOP GENERATION is a trademark of Data General Corporation. © 1984 Data General Corporation, Westboro, MA



Vendor Supplied Features	Data General Model 20	IBM PC-AT Model 99
Multi-User*	Up To 16	Up To 3 Promised
OFFICE AUTOMATION		
Word Processing	Integrated	Stand Alone
Electronic Filing		Stand Alone
Calendar & Scheduling		Stand Alone
Electronic Mail		Stand Alone
Phone Messaging		Stand Alone
Decision Support		Stand Alone
Interrupt Capability		Stand Alone

Cartridge Tape Backup	Yes	No
Maximum Hard Disk Storage	77 MB	40 MB
Multi-User SNA	Yes	Promised
X.25 Networking	Yes	No
Ethernet	Yes	No
BASIC	Yes	Yes
COBOL	Yes	Yes
FORTRAN	Yes	Yes
Pascal	Yes	Yes
Multi-User Applications	Now	Promised

Data General delivers what IBM only promises.

 **Data General**
a Generation ahead.

IN DEPTH/COBOL ON MICROS

written to extract sequential files on one side and read and load the indexed or random files sequentially on the other.

In the worst case, programs may be required to perform both operations on both sides. While the time to write these programs may be trivial, the time it takes to load indexed files on a micro can be agonizingly long if more than a few hundred records are involved.

This slowness will be magnified to alarming levels if the micro uses floppy disks rather than hard disk. It will take hours, not minutes, to load a reasonably sized Isam file from sequential input.

To summarize, then, while it is possible to convert programs from mainframe to personal computer using Cobol code, it is not at all as simple as it appears on the surface.

Obviously, Fedanzo has done it successfully, and with the right mix of hardware, compiler and application software, so can you. But I would advise doing an in-depth study of all the factors mentioned here before proceeding.

In fact, it might be worthwhile to invest in a number of Cobol compilers for the target microcomputer and try your luck with all of them using some relatively small and noncritical system as a testing and learning tool before proceeding to bigger things. The cost of compilers is small compared with the total development effort likely to be involved.

Additional considerations

Given that the idea of moving some applications from a mainframe to a personal computer is valid in many cases, I would suggest that you

consider using one of the personal computer data base management systems, such as Ashton-Tate's Dbase II or III or Microrim, Inc.'s R:Base, instead of Cobol to generate the micro application.

These products are easier to learn and use than Basic, Pascal, C or other languages which are so adored by the micro gurus. Any competent Cobol programmer should become proficient with any of them in less than a week. Not only that, but the resulting application may be cleaner and friendlier to the user than something hacked up out of old Cobol code.

It is highly likely that writing the application over using one of these micro products will require less time than converting the Cobol code, even allowing for programmer learning curves. Additional benefits may accrue from the ability to create addi-

tional reports or screens quickly using the facilities inherent in the personal computer product.

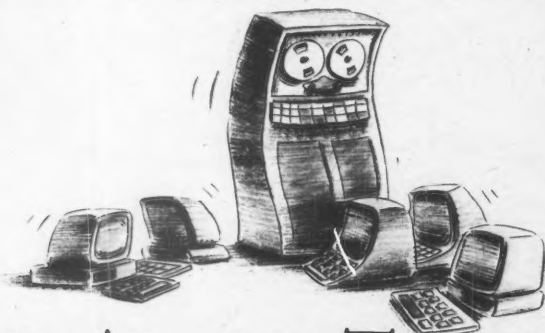
Using Dbase II, for instance, you can create a whole new report in just minutes, as opposed to hours using Cobol. The file transfer problem is no worse than for Cobol to Cobol, given the necessity to create sequential update files in either case. The above-mentioned products allow creation of files in "foreign" formats with little effort.

It is time to start training some of our Cobol programmers to use micros effectively, which means giving them some modern tools to work with and allowing them the time to learn how to use them. While moving Cobol code directly to micros may produce some short-term gains, training experienced Cobol programmers in the use of personal computer tools appears to be a much better long-term investment in talents and resources.

If DP professionals are going to retain control over corporate data processing policy, they must learn how to use micros effectively, as many of their users already do. It's time to stop using the broad base of Cobol programming skills out there as an excuse to justify keeping ancient and inefficient systems alive through yet another generation.

About the author

Dick Burkhalter is a business systems consultant for Diverse Developments, a Canoga Park, Calif., consulting and programming firm serving business users of micros.



IT'S ABOUT TIME WE ALL GOT TOGETHER AND TALKED.

GET RESPOND™ COMMUNICATIONS SOFTWARE.
IT'S HELPING CORPORATE AMERICA BRIDGE THE PC COMMUNICATIONS GAP.

Now your company's executives can get the most out of their PCs. And you can standardize your operations for greater control. Not to mention savings on training, support, software and terminals.

Designed for IBM and compatible PCs, RESPOND software integrates all the communications power you'll ever need. Its unique advantage is RESPOND Architecture™—the interface that is the basis for all our products.

RESPOND/TTY™ provides access to all major information services. Plus complete communications and data transfer capability—PC-to-PC or PC-to-mini or mainframe—anywhere in the world.

RESPOND/Async™ incorporates TTY and enables a PC to emulate such asynchronous terminals as the DEC VT100/52, IBM 3101 and the HP 2621B.

RESPOND/Sync™ is a series of products which emulate various IBM synchronous terminals using IBM or Techland Systems' Blue Lynx™ communications adapter boards (SDLC or BSC). Each emulator disk in this series also includes TTY.

RESPOND/ALL™ is the most complete package available today. It combines both asynchronous and synchronous communications in a single product.

Users can start with any one of our products. Then as needs change, upgrade to a new package.

All without any new learning.

That's because every RESPOND product, beginning with TTY, offers all the features that make our software so easy to use. Simple menus on every screen. XPRESS keys to by-pass menus. Pre-set profiles to save set-up time. Our fail-safe HELP feature. Plus completely unattended communication—while the user's away or even running another program on the same PC. And for technical assistance, our Customer Support Department just doesn't quit.

Who's responsible for such a comprehensive line of products for corporate communications? The foremost innovators in the field: Software Synergy, Inc.

466 Main Street
New Rochelle,
New York 10801.
Send for our free
color brochure.
Or, let's talk
(914) 633-0400.



RESPOND™
COMMUNICATIONS SOFTWARE
NOW YOU'RE TALKING

THE UNIX™ SYSTEM ENCYCLOPEDIA



The UNIX System Encyclopedia is the largest available collection of information about the UNIX marketplace. Over 400 pages are filled with a comprehensive UNIX directory including 100 pages of manufacturer specifications and photographs, software reviews, and articles on the UNIX system.

- ☐ Please send me a copy of The UNIX System Encyclopedia \$38.20 (includes \$3.25 shipping and handling).
- ☐ CALIFORNIA RESIDENTS \$40.48 (includes 6.5% sales tax).
- ☐ INTERNATIONAL \$41.20 (includes \$6.25 shipping and handling).

NAME _____
TITLE _____
COMPANY _____
STREET _____
CITY _____
STATE _____ ZIP _____

Yates Ventures
3350 Bayshore Rd., Suite 201
Palo Alto, CA 94303 (415) 424-8844

UNIX is a trademark of Bell Laboratories

**ANOTHER
UNIFIED SOLUTION
FROM HONEYWELL.**



TRACTS combines data processing and office processing capabilities in a single Unified Solution to the need for improved Medical Record Management.

TRACTS allows efficient tracking of incomplete records by location and degree of completion.

Extensive capabilities enable TRACTS to communicate a variety of information systems.

TRACTS features an extensive vocabulary of industry specific terms.

A MEDICAL RECORDS SYSTEM THAT WORKS JUST LIKE YOUR CENTRAL NERVOUS SYSTEM.

The marvel of our central nervous system is that thousands of bits of information can be received, transmitted and stored all at the same time.

Now Honeywell has created a medical record system for hospital administrators that works the same way.

It's a unique combination of office automation, data processing, and communications called TRACTS—the Transcription Recording and Chart Tracking System.

Integrating the finest medical record software with our

expandable line of hardware, TRACTS is another Unified Solution from Honeywell.

TRACTS is built around Honeywell's Office Automation System (OAS), designed to free hospital staffs from redundant and time consuming tasks, while improving speed and accuracy at the same time.

In addition, TRACTS mini-computer operating system GCOS 6 MOD 400 offers a wide variety of data processing options. Data base management systems, high-level language support, custom application programs, and data communications are all part of TRACTS.

The system also supports electronic mail, InfoCalc, file transfers and an array of other

application programs. No other system is so complete.

And when hospitals can operate with that kind of precision, we all benefit from better health care.

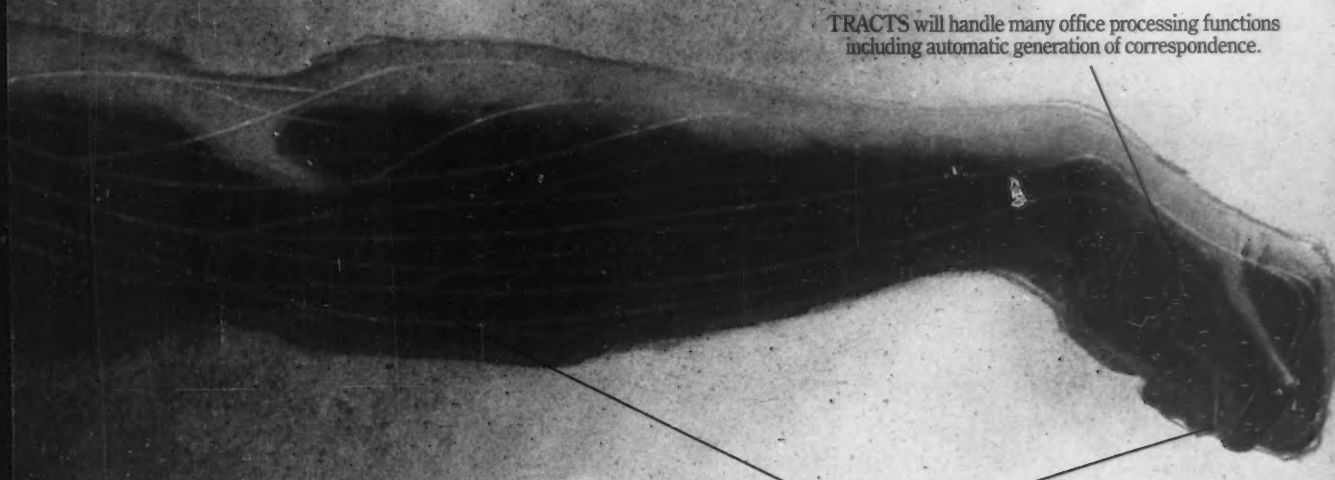
Find out more about TRACTS today. Call us at 800-328-5111, Ext. 2747 (in Minnesota, call collect: 612-870-2142, Ext. 2747). Or write to the Honeywell Inquiry Center, 200 Smith Street, Waltham, MA 02154. We'll be happy to send literature, discuss the system with you, and even arrange a demonstration.

Together, we can find the answers.

Honeywell

TRACTS will handle many office processing functions including automatic generation of correspondence.

Parameter driven TRACTS system can be tailored to meet specific requirements.





Why people choose an IBM computer in the first place is why people want IBM service...in the first place.

After all, who knows your IBM computer better than we do?

That's why we offer maintenance agreements on computers such as our System/34, System/36 and Series/1. Just another example of blue chip service from IBM.

That means your IBM service representative has a personal stake in the performance of your IBM equipment. It means fast, effective service and IBM parts.

It also means, when necessary, we'll see that you get the benefits of our technical

support network and engineering changes that will help keep your IBM computer running smoothly.

Quality. Speed. Commitment. That's why an IBM maintenance agreement means blue chip service.

To find out more about the specific service offerings available for your IBM computer, call 1 800 IBM-2468, Ext. 90, and ask for Systems Products.

Blue chip service from **IBM**

DECEMBER 17, 1984

10 / 11

IN DEPTH



Don't rely on the law to stop computer crime

**By Nancy Finn
and Peter Finn**

It is estimated that by the end of next year, more than 10 million personal computers will sit beneath the fingertips of American workers. These tools open up new opportunities for their owners, but they also open the door to infiltration into company business records and the deliberate distortion of information by unauthorized individuals. Losses resulting from computer-related crimes now range between \$100 million and \$300 million annually in the U.S.

There is no agreement among legal experts as to what constitutes a computer crime. Consequently, a generally accepted definition of a computer crime is notably absent from current legal opinion. Some experts dismiss the concept entirely, referring to "computer abuse" or "computer-assisted crime."

Computer abuse, broadly defined, is any incident associated with computer technology in which a victim suffered, or could have suffered, loss

and a perpetrator, by intention, profited or could have profited.

Computer abuse can fall into one of five categories of currently recognized crime: financial crime, information crime, theft of property, theft of services and vandalism.

In view of the legal system, which often leaves the victim of computer abuse without recourse, it is essential users install preventive security measures as the first line of defense.

■ Financial crime is the taking of funds via computer, for example, executing the theft of a payroll through a computer system or just shifting monies from one account to another.

■ Information crime involves the acquisition of valuable information via computer, such as a company's mailing list, a list of solicitations or other contributions. It is one of the least detected and most costly of computer crimes.

■ Theft of property is simply the taking of computer hardware for personal sale or use. It is the easiest crime to categorize and prosecute.

IN DEPTH/COMPUTER CRIME

■ Theft of services is the unauthorized use of a computer, for example, use of a company's computer for personal, nonofficial use.

■ Vandalism is intentional damage to a computer or computer system, either physical destruction or alteration.

Some computer abuse fits more easily into the traditional criminal statutory scheme, such as theft of physical computer property and vandalism. Other types of abuse, such as the taking of information or services, are more difficult to analyze in traditional terms.

Notwithstanding the difficulty involved, it is essential that there be a recognition of the type and magnitude of harm caused by the computer crime so that there is proper analysis of the computer abuse problem. What the courts and the legislatures have to recognize is that computer abuse can occur in unobtrusive ways such as through fraudulent access or bugging of software. Unauthorized users are often so familiar and comfortable with the computer system that detection is particularly difficult.

It appears on the surface that computer abuse might easily be prosecuted under the law of theft. However, traditional criminal statutes such as larceny have been inadequate and ineffective in prosecuting computer abuses. Inherent in the law of theft is the notion that property capable of being stolen must be tangible and that such property must physically change possession. Thus, it is extremely difficult to prove the law of theft in the instance of computer theft without the abuser having physically removed a tangible item.

Tangibility Issue

The tangibility issue was addressed in the case *Ward v. Superior Court* (California, 1972). The court found that the defendant had not stolen an "article" within the meaning of the penal code because implicit in the definition of the article is that it must be something tangible. The court found that electronic impulses are not tangible.

A further complication arises in determining the valuation of an item that, in the case of a computer crime, might not be tangible. Is the valuation of the stolen property based upon the price of the paper on which the program was written, or is it the value of the bit of information to the company or the owner of the program? The valuation is necessary in order to distinguish between an offense punishable as a felony and an offense punishable as a misdemeanor. Assessing damages in this instance is a speculative issue,

and statutes have not been developed to address the issue.

One case that illustrates the problem of inadequate criminal statutes is *U.S. v. Siedlitz*. An individual used a telephone to gain access to a former employer's computer and thereby obtained a valuable and confidential program. The U.S. attorney in Maryland and Virginia attempted to prosecute the theft but encountered difficulty in using the federal

statute prohibiting interstate transportation of stolen property.

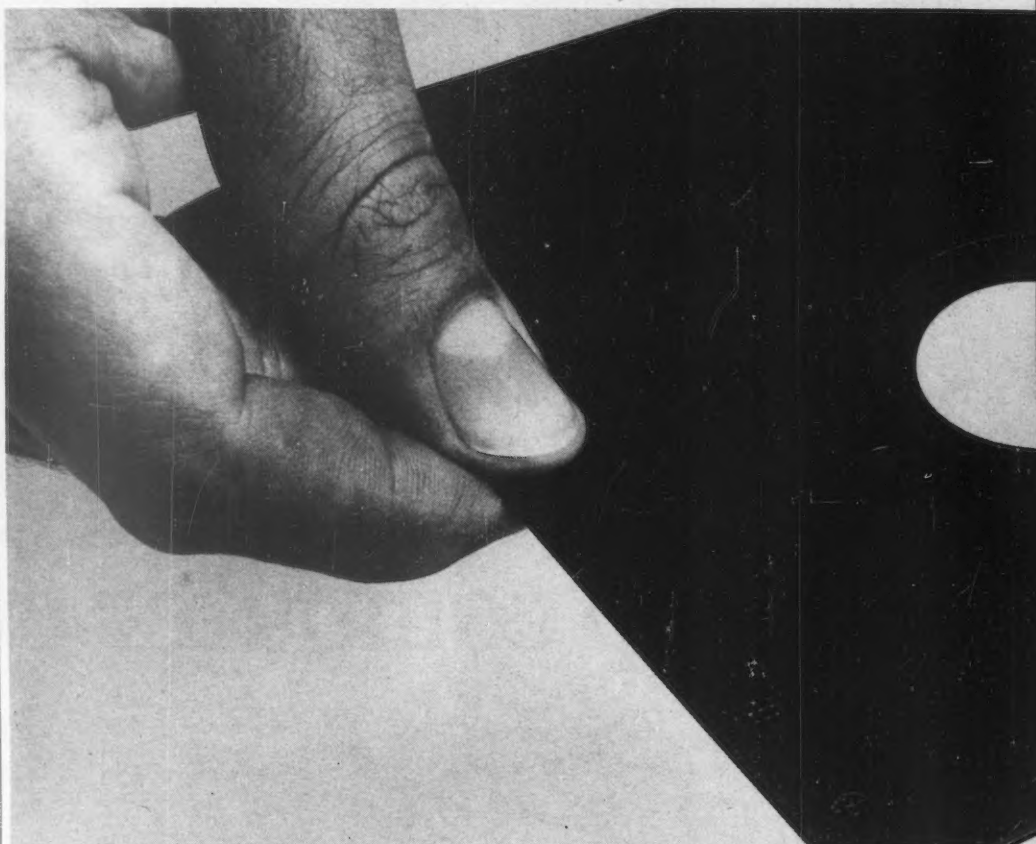
Not only was the statute unclear about whether the electronic impulses were property within the requirements of the statute, but furthermore, the movement of magnetic impulses from the victim's computer to the defendant's computer did not satisfy the traditional interpretation of "stealing" or "taking" of property as required by the statute. This

ambiguity clearly demonstrates the complications that exist both in determining whether or not there was a theft under the law and whether or not the object of the theft can be classified as property.

Many federal and state criminal statutes, including embezzlement, invasion of privacy, trade secret, copyright and even mail fraud laws, have been used to prosecute computer crimes. It is often erroneous, however, to

apply these criminal statutes to computer crimes, because the intent of the specific law often represents different issues from those in the computer crime instance.

For example, in cases of embezzlement, if no property or money is converted, the criminal charge cannot be maintained. In the event of a trade-secret theft charge, there is the issue of "unprotected disclosure," whereby, if the computer trade secret owner failed to take reason-



This one sloppy floppy can

THE SLOPPY FLOPPY

Most companies seal their discs with a spot here, a spot there. Leaving most of each seam not sealed at all.

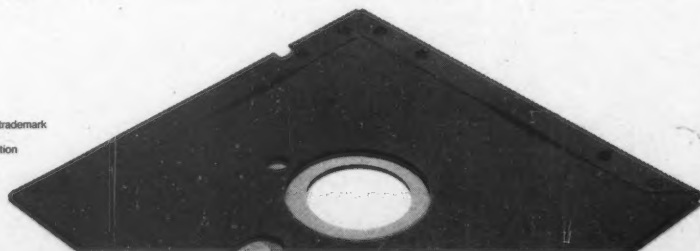
Sooner or later, the seams might do what comes naturally: they bulge. Warp. Pucker. Open up.

You can prove it to yourself. Just take a floppy and twist it.

See those wide open spaces?

That's sloppy. And dangerous. Because if you put a sloppy floppy into your disc drive, it can jam the drive. Lose your data. Or ruin the drive head.

And there goes \$400.



Memorex is a registered trademark of Memorex Corporation.
©1984 Memorex Corporation

IN DEPTH/COMPUTER CRIME

The most innovative approach to the computer abuse problem is the Florida Computer Crimes Act of 1981. It created two new classifications of computer offenses: an offense against intellectual property and an offense against the authorized computer user.

able precautions to protect the secrecy of the thing allegedly stolen, the law does not apply.

The case of *New York v. Weg* (New York Superior Court, 1982) illustrates how difficult computer crime statutes can be to uphold. The judge dismissed the theft of services charge against a computer systems manager employed by the New York Board of Education who used school computers to trace the genealogy

of horses and create a handicapping system for betting.

The court found that Theodore Weg had not stolen time because his supervisor had given him general access to the computer. If Weg had plugged into a public computer without permission and was trying to avoid payment, his acts may have been considered criminal.

Legislative efforts

The most innovative approach to the computer

abuse problem is the Florida Computer Crimes Act of 1981. It creates two new classifications of computer offenses: an offense against intellectual property and an offense against the authorized computer user. The first classification provides that whoever willfully, knowingly and without authorization modifies or destroys data, programs or supporting documentation, internal or external to a computer, is guilty of a felony against intellectual property. The second offense holds an individual liable for a felony if he, without authorization, denies an authorized user access to computer system services.

This statute distinguishes between misdemeanor and felony crimes on the basis of whether the offense results in damage, destruction or fraud or results in the interruption of government operation of public services and whether the amount of damage to the computer or computer system falls within a specific range described in the statute.

Another unique aspect of the Florida statute is that it recognizes computer abuse as a separate criminal activity within a range of degrees and penalties. By penalizing many types of computer abuses such as unauthorized access, the statute shifts the focus away from the harm, the tangibility of the item or the possession characteristics inherent to conventional theft laws.

Twenty-one states have passed specific computer crime laws directed toward the special needs of prosecuting computer abuse and misuse.

Legislation on the federal level has been limited.

This past year, Congress enacted two pieces of computer crime legislation. The Small Business Computer Crime Prevention Act sets up a private and public task force to investigate the problem of computer crime in small business and recommend preventive measures.

Just before adjourning in October, Congress hastily passed computer crime amendments attached to the continuing budget resolution. The amendments make it a federal crime to gain unauthorized access to data stored in computers used by the federal government or to financial data protected by federal privacy statutes. The legislation (a compromise version of H.R. 5616) does not address illegal entry into other private-sector computers.

Most recent federal legislative efforts have been unsuccessful. The Federal Computer Systems Protection Act (H.R. 1092) spent five years in subcommittee and was bypassed this year by H.R. 5616.

ruin your \$400 disc drive.

THE MEMOREX® SOLID-SEAM BONDED FLOPPY

Memorex seals its floppy discs with a process it developed, called Solid-Seam Bonding.

Solid-Seam Bonding seals shut every inch of every seam of every Memorex floppy disc. Tight as a drum. That makes the Memorex floppy stiffer. Stronger. And your data safer.

You can prove it yourself. Just take a Memorex floppy and twist it. You'll see no wide open spaces.

No wide open spaces that can jam your drive. Lose your data. Or ruin your drive head.

Which could cost you \$400.

So why risk it?

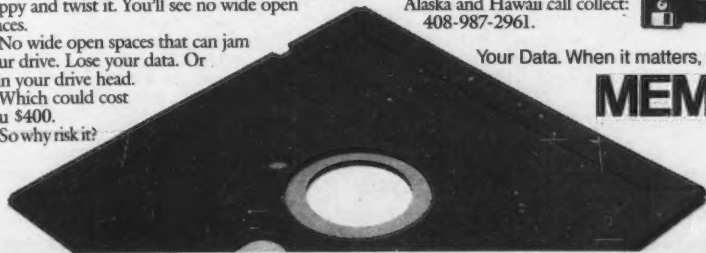
Protect your drive. And your data. Ask for Memorex floppy discs, with Solid-Seam Bonding.

It's always better to be safe than sloppy.

For more information on the full line of Memorex quality computer media products, including computer tape, call toll-free: 800-222-1150. In Alaska and Hawaii call collect: 408-987-2961.

Your Data. When it matters, make it Memorex.™

MEMOREX
A Burroughs Company



IN DEPTH/COMPUTER CRIME

At issue is whether the existing body of law is fully adequate for both the crime and the punishment. At issue also are potential conflicts over jurisdiction between the states and the federal government.

There were concerns about the adequacy of H.R. 1092, which failed to define such key terms as "computer." Some observers feared that such imprecision might lead to misapplication or abuse of the legislation itself, for example, in prosecuting offenses committed by minors.

It was also argued that the proposed legislation focused upon the instrument rather than the object of the crime: the computer rather than the information, its tangible and intellectual properties and individual rights. While there is a certain truth to this argument, the body of law regarding information, its sensitivity

and value as well as its intellectual property, is even less well defined.

A number of bills languished in Congress during 1984 and, specifically, in subcommittee. In 1984, four bills awaited action in the House Judiciary Subcommittee.

H.R. 4301, introduced by Rep. Larry Coughlin (R-Pa.), was unique in that it was only three paragraphs long. The bill would make the use of a computer in a manner not authorized by the owner a federal crime punishable by a fine of up to \$100,000 and up to 10 years' imprisonment.

In February 1984, Sen. William Cohen (R-Maine) introduced in the Senate the Computer Crime Prevention Act of 1984. The bill, which died in October, contained provisions and penalties for buying, procuring or selling the passwords to the comput-

ers covered in the legislation in order to obtain money or services illegally. The penalties for this offense would be \$50,000, or three times the amount obtained, and/or a maximum prison sentence of five years.

To deter computer hackers, penalties for any unauthorized access not involving fraud or damage would be up to \$5,000 and one year in jail.

Civil law

While most attention is currently being given to the criminal aspects of computer abuses, it is likely that civil action will have an equally important effect on long-term security problems. The issue of computer crime draws attention to the civil or liability aspects in computing environments.

In the future, we can expect to see many more individual and/or class-

action suits. For example, a stockholder might sue a corporation that had to devalue its assets and stock because of computer fraud-related losses. Another scenario might involve stockholders filing suit because the loss of highly sensitive trade secrets seriously affects the corporate balance sheet. Liability of the corporation and its officers to protect its assets and resources, such as imposed by the Foreign Corrupt Practices Act, will also be tested.

Civil damage suits will test the concepts and limits of legal responsibility and culpability. It will be interesting to see how the courts, state and federal government attempt to determine responsibility and assign liability for damages. Who will be at fault? The user, for not providing better security for the system? The equipment manufacturer, because of alleged flaws in the security design?

Even today, the liability battle lines are being drawn. Vendor advertisements in major national maga-

TELECOMMUNICATIONS USERS:

It's All Here!

Attend the first, the most comprehensive and the most important telecommunications conference and exposition of the year . . .

THE SEVENTH ANNUAL

Communication Networks '85

CONFERENCE & EXPOSITION

WASHINGTON, D.C./JANUARY 28-31, 1985

Whether you've been in the telecommunications field for one year or ten, you've never seen things changing so fast. It's exciting . . . complex . . . confusing. That's why you need to attend COMMUNICATION NETWORKS '85.

Even if you can spare only one day, it will be worth your while to get a look at the very latest in telecommunications products and services — data communications equipment, including modems, multiplexers and high-speed T1 class transmission equipment . . . hardware and software for Local-Area Networks . . . electronic PBXs . . . satellite transmission . . . fiber optics . . . new low cost, long-distance services . . . and more.

750 EXHIBIT BOOTHS,
OVER 200 COMPANIES

The exhibits alone will be an education — new products and services offered by some of the world's leading companies will be on display, including AT&T, Digital Equipment Corporation, GTE, Hewlett-Packard, IBM, ITT, RCA, and more.

FULL CONFERENCE PROGRAM

Come to the exhibit hall only or plan to attend any of the seminars and presentations with such speakers as James Martin, Arch McGill, Dennis Patrick and 200 other speakers and panelists. Both introductory and advanced sessions will be held. Free bus service will be provided between the conference location and conference hotels. For complete conference program details, call 800-225-4698, toll free. (In Massachusetts, call (617) 879-0700.)

SAVE \$5 ON ADMISSION TO EXHIBITS

Bring this special coupon to the Washington Convention Center with \$5 cash. It's worth \$5 off



In the future, we can expect to see many more individual and class-action suits.

zines proclaim that "privacy begins at home," and "computers don't steal, people do."

In equipment lease agreements, many vendors very clearly spell out that the lessee bears full responsibility for all aspects of system security. Clearly, as liability issues are tested in the courts, all parties — the end users, corporations providing computer-based services and the manufacturers of computers and related systems — will be forced to look more clearly at their own areas of responsibility and act accordingly.

Nonlegal remedies

In view of the legislative weaknesses, which often leave the victim of computer abuse without any legal recourse, it is essential that computer users look to preventive security measures rather than to legal measures as the first line of defense. Among the commonsense rules for safeguarding data are the following:

■ Regularly change the password for access to the system.

■ In addition to the password, require such personal information as an employee's name, birthday or identification number. It is far more difficult for someone to come up with two correct identifications.

■ Limit the number of attempts that anyone can make to log on to a system.

■ Keep a record of all user activity in a system and monitor this log to detect any unusual activity such as repeated failures by someone to enter a correct password, unusual amounts of data retrieval and attempts to enter confidential files.

■ Follow through at a top management level by allocating the money and staff necessary to carry out these steps. Prosecute any security violations, whether employees or outsiders, even if it means adverse publicity.

There is software available that will improve security. These programs typically limit the number of

the regular \$10 exhibit registration fee. Exhibit hours are:

Tuesday, January 29 — 10 AM-5 PM

Wednesday, January 30 — 10 AM-5 PM

Thursday, January 31 — 10 AM-3 PM

You'll also get to meet exhibitors informally in their hospitality suites, plus enjoy all the fun and excitement of the Nation's capital city.

And you'll be eligible to attend a free conference session and to win one of several prizes, including an AT&T Personal Computer.

DON'T MISS COMMUNICATION NETWORKS '85 in Washington, D.C. — the most important telecommunications conference this year.



COMMUNICATION NETWORKS
CONFERENCE & EXPOSITION
Washington, D.C. / January 28-31, 1985
Box 880/Framingham, MA 01701/617-879-0700

BRING THIS COUPON AND SAVE \$5!

\$5

This coupon entitles bearer to \$5 off the \$10 exhibit registration fee at COMMUNICATION NETWORKS '85. Valid Jan. 29 (10-5), or Jan. 30 (10-5), or Jan. 31 (10-3) at the Washington Convention Center, Washington, D.C. No pre-registration required. Coupon must be presented at the door with \$5 cash for exhibit admission.

\$5

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Phone () _____

WORTH \$5 OFF ADMISSION TO EXHIBITS

IN DEPTH/COMPUTER CRIME

tries a user gets to type in a correct password and will prevent intruders from repetitively guessing until they hit a valid password. This type of software ranges in price from \$9,000 per year for an annual rental to about \$30,000 if purchased.

A dial-back system is also available that screens out the thief trying to forge a password. When a user calls into a computer, a black box intercepts the call and asks for a password. The unit then disconnects the phone call, looks up the password in a directory and calls the user back at the phone number listed in the directory.

Corporate personal computers also need protection. With proper precautions, there is a far greater opportunity for legal action in the event of computer abuse than there would be if no precautions were taken. The same issues that arise if fire protection is ignored and there is a question of insurance coverage hold true for computer security; it is also questionable when proper computer security is not undertaken.

Poor controls

Even today, most organizations do not recognize that their information is sensitive or critical. They basically do not adequately analyze the potential impact of an unauthorized entry. Lacking this understanding, companies fail to apply currently available physical and logical security controls to their sensitive and critical data. Where controls are applied, they are often incompletely implemented, poorly monitored or improperly managed.

The issue is further broadened by the wild proliferation of personal computers in organizations and the increasing ease with which computers can be tapped into via telephone lines. If a corporate executive stopped to figure out how much business could be lost if computer files were damaged or how much it would cost in man-hours to replace or reconstruct files that had been tampered with, they would realize the importance of computer security.

The ability of technology to build high-integrity software and certify that it possesses the necessary security and control attributes is extremely limited. Furthermore, office automation applications are creating important new privacy policy issues for management that go unrecognized.

A large majority of organizations are so busy with the hardware and software aspects of office automation that they have not begun to take these policy problems seriously. It has become apparent that professional and executive applications in the office environment can lead to data handling that can violate organizational and legal standards of data privacy.

In the 1970s, federal or state statutes covered confidentiality regarding federal agency practices, credit reporting, employment and insurance investigations, law enforcement and medical records as these various endeavors were plugged into computer systems. The trend toward office automation calls for extending those privacy standards from data processing into the office.

However, office automation, unlike data processing, does not store large volumes of information in centralized, organizational systems. Information in the office environment

is scattered among many individuals and on many personal computers and other computer systems where there is an inherent lack of sensitivity to the principles of information security. The danger is even greater than it has been in the data processing environment since information that is kept in office files is often more finished and refined than the raw statistics found in the corporate mainframe.

As electronic messaging systems begin to proliferate and data is accessible and available to a number of people, confidentiality breaches will inevitably happen.

This risk has created a whole new compendium of issues around privacy concerns that have not been addressed either through the law or in common practices within the business community.

As the number of systems increases, crime problems will increase. The potential for this increase was set forth in the testimony of John C. Kenney, acting U.S. Assistant Attorney General for the Criminal Division before the Senate Subcommittee on Criminal Laws and Procedures. Kenney said:

"Our political, economic and social institutions have grown increasingly dependent upon computers to the point that their illicit manipulation or malicious destruction can potentially wreak havoc on society. Consider in this regard the consequences resulting from the willful destruction of the computer-generated Social Security checks flowing to the elderly or disabled, the destruction of a bank's computer records of its demand deposits or the malicious destruction of irreplaceable medical

research data stored in a computer bank.

"Computers have become a part of everyone's life and are being integrated into virtually every facet of human activity at an ever-increasing rate. The very existence at the present time of a broad base of computer usage and computer knowledge and its projected increase in the years to come suggest that we will experience an increase in the opportunities for computer-related abuses in the years ahead."

About the authors

Nancy Finn is an office automation consultant for Communication Resources, Needham, Mass. Peter Finn is an attorney with the Boston law firm of Guterman, Horvitz, Rubin and Rudman.

If your IBM PC repair service leaves you cold...



Warm up to

PC/RESERVE™

Anytime. Anywhere. On-site or overnite.

PC/RESERVE offers prompt, professional on-site service and support by more than 1100 technicians coast-to-coast. Optional blanket coverage can protect you 24 hours a day, 7 days a week.

Or, PC/RESERVE can replace your failed equipment with an identical unit. Overnite. Nationwide. Guaranteed, whether it's IBM or any number of compatible peripherals.

PC/RESERVE saves time and cold cash. We can design an on-site/overnite program that won't freeze your budget. If you don't want the cold shoulder next time your PC goes down, call PC/RESERVE today.

We support the IBM PC, IBM PC XT, IBM Portable PC, IBM PCjr, IBM 370 XT, IBM 3270 PC, IBM Personal Computer AT™ and many compatibles.

Anytime.
Anywhere.
On-site or overnite.

RTK
RT/KATEK
Computer Services
215 Wood Avenue
Middlesex, NJ 08846
1-800-932-0448
Ext. 44

IBM is a registered trademark and IBM Personal Computer AT is a trademark of International Business Machines Corporation.

™ Trademark of International Business Machines Corporation.



THE TOTALLY COMPATIBLE TERMINAL.

The 5540 terminal from Teletype Corporation is ideal for 3270 protocols, agrees with your pocket-book and gets along so well with people that you'll wonder how you got along without it.

As our third generation of 3270-compatible terminals, the 5540 represents an even better value than its predecessors. Besides being competitively priced, the 5540 supports 3270 SNA/SDLC in addition to 3270 BSC line protocols.

The 5540 also has a more powerful microprocessor-based controller that will cluster up to 32 devices, including our letter quality printer. We also offer a tabletop controller that will cluster up to 12 devices.

Available with standard and reduced size displays, 4-color capability and 80 or 132 column formats, the 5540 can be tailored to your specific needs. And, each display has a smudge-resistant, non-glare, high resolution tilt screen.

To further enhance operator productivity, the terminal features a detachable keyboard with 3270-like layouts, 24 program function keys, and a status line that includes a response time monitor.

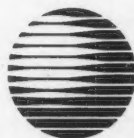
Backed by our experience in building over 300,000 3270-compatible terminals, the 5540 is building a strong record for reliability. If problems occur, self-diagnostics pinpoint them.

You'll find our 5540 terminal is very easy to like.

If you'd like to get to know it a little better, write:
Teletype Corporation, 5555 Touhy Ave., Dept. 3223-F,
Skokie, IL 60077. Or call 1 800 323-1229, ext. 501.

TELETYPE: VALUE SETS US APART.

"Teletype" is a registered trademark and service mark of Teletype Corporation.



AT&T

Teletype Corporation

INVEST IN THE BEST

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY





NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 709 FRAMINGHAM, MA 01701

postage will be paid by

CIRCULATION DEPARTMENT

COMPUTERWORLD

375 Cochituate Road, Rte. 30
Box 897
Framingham, MA 01701-9985

SYSTEMS & PERIPHERALS

Panel weighs supercomputer potential

By John Desmond
CW Staff

TARPON SPRINGS, Fla. — Experts at a Gartner Group, Inc. conference panel on supercomputing held here recently could not agree on a precise definition of a supercomputer or on the machine's commercial potential, but they did agree that demand for the fast-processing machines exists and that engineering applications are practical now.

The five-member panel at the IBM Large Computer Market Conference was led by David L.R. Stein, a general partner in the Julian, Cole and Stein venture capital firm and a cofounder of the Gartner Group. Other panel members were Carl Claunch, director of marketing technology planning with National Advanced Systems, Inc. (NAS); Arthur Leiz of Grumman Data Systems Corp.; Robert Wayne McIntyre, director of special-purpose systems for Amdahl Corp.; and Gregory P. Williams, a vice-president of the Gartner Group.

Explaining why a discussion of supercomputing was being conducted at a conference for users of IBM 370-compatible mainframes, Stein said the 370 architecture is not incompatible with supercomputing, a term he said was coined by Control Data Corp. in the early 1960s. That is a change from the thinking of 20 years ago, when IBM 360 architecture (the 370's predecessor) was considered incompatible with supercomputing.

Although many early innovations in computing were the results of efforts to develop supercomputers, "For whatever reason, supercomputers seemed to fall on hard times" in the past 10 years, Stein said. But he said recent achievements by Japanese manufacturers in supercomputing, on machines that have a "significant relationship" to 370 architecture, have helped spur a renewed interest in supercomputing. "I don't know whether it's a Japanese challenge or the fact that we've outgrown our mainframes for some applications, but I have seen a resurgence in interest in supercomputers in the last several years," Stein said.

Claunch of NAS defined supercomputing as processing that exceeds the capacity of the largest general-purpose mainframe. Supercomputing is accomplished by restricting processing to that which can be executed more quickly under a special set of instructions, sometimes called vector processing, he said. Certain work that can be accomplished within the limited instructions can make use of the supercomputer, he said. Ten years from now, NAS is projecting that 10% to 15% of all large mainframes will include vector processing capability.

Leiz of Grumman suggested Claunch's definition of supercomputing is not adequate because as mainframe processing rates go up, more processing can be accomplished with general-purpose mainframes. Claunch said the definition could be that a supercomputer executes 10 times faster than general-purpose mainframes.

"I don't know if I have a good definition for a supercomputer other than to say that they run real fast when they have floating-point arithmetic," Amdahl's McIntyre said. The potential speed of a supercom-

See PANEL page 59

IBM 3081 seen as path to Sierra Analyst says CPUs will attract Model K users

TARPON SPRINGS, Fla. — At a recent conference on "Strategies in an Era of IBM Strength," Michael A. Chuba of the consulting firm Gartner Group, Inc., predicted that IBM's 3081 Model K will be the "exit machine" used to shuttle users into initial models of IBM's Sierra series of mainframes, which the Gartner Group claims will be announced in the spring of 1985.

IBM is trying to have 50% of the installed base of 3080 Model X processors on the 3081 Model K when the Sierra is announced, Chuba said. The Sierra announcement will compare its performance to the 3081 Model K, and not all the Sierra's features will be announced in the initial product, predicted Chuba, who is program director for Gartner's IBM Large Computer Market service.

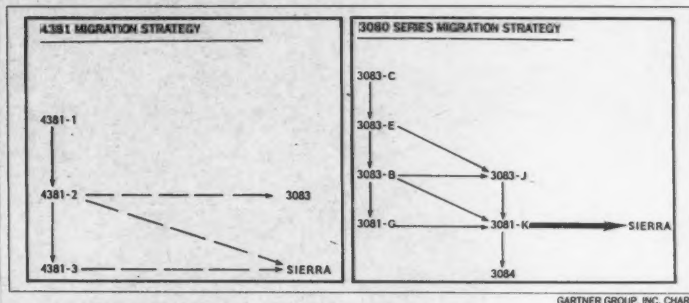
To make projections of likely features of the Sierra series and options for users of IBM's 3080 and 4300 series, Chuba employed the Gartner Group's Residual Asset

Value for IBM Systems software model for describing the IBM market. Gartner Group justifies using only IBM in the model on the basis of the company's dominant position in the industry.

In describing IBM's dominance, Chuba said that 60% of IBM's revenues are derived from the 370 hardware and software still employed in most of its current line CPUs. Since IBM accounts for 40% of worldwide data processing revenues for U.S. manufacturers, the 370 accounts for 25% of worldwide DP revenue from U.S. manufacturers, Chuba said. The 370 hardware and software products comprise "the single largest segment of the data processing industry," Chuba said.

Moreover, Chuba said IBM has 25,000 mainframes and 100,000 disk drives installed in the U.S. today. IBM has been steadily increasing market share at the expense of the firms that make up the Bunch

See CHUBA page 58



Expected migration to anticipated IBM Sierra series

GARTNER GROUP, INC. CHART

Hitachi experimenting with Cmos chip

SAN JOSE, Calif. — Hitachi Ltd. said it has developed an experimental 32-bit Cmos microprocessor chip called the Micro 32.

According to Hitachi, the unit was fabricated on a 1.3 micron Cmos substrate using a two-layer metal process technology.

The chip is said to contain more than 300,000 transistors.

Internal throughput

Micro 32 reportedly offers internal throughput of

roughly 5 millions of instructions per second.

Hitachi said the unit incorporates a 200K-bit read-only memory with a 50-nsec cycle time. The chip measures 6.5mm by 9mm, but no definite packaging configuration has been established.

Hitachi said the product will not be commercially available until late 1986.

According to the vendor, volume shipments are slated to begin in mid-1987.

For more information, Hitachi is headquartered at 2210 O'Toole Ave., San Jose, Calif. 95131.

Modcomp CPU controller supports 32 I/O options

FORT LAUDERDALE, Fla. — Modular Computer Systems, Inc. (Modcomp) has announced the APC/5 Advanced Programmable Controller for use on the company's Classic CPU in industrial automation markets for support of 32 process I/O options and up to 2,048 I/Os.

The product is said to support a range of data types in digital I/O and analog I/O and to simplify programming. The programming device is said to enable engineers to define the logic with standard Instrument Society of America (ISA) symbols.

The APC/5 combines the Modcomp Modacs V hardware with software designed by Thesaurus, Inc. The controller can be used for applications with 250 to 1,024 processing I/O points. The APC/5E provides for systems as large as 2,048 process I/O data points. The controller has the capability to display seven inputs and one output on each line of a ladder diagram on the

color terminal, the vendor said.

Use of ISA standard graphics character symbols and colors allows quick recognition of elements and power-flow states. Up to 16 lines may be included in one network with a possibility of up to 999 networks, each operating in specified time segments of 50 msec, seconds or minutes. The user can create or edit one control algorithm while displaying another, the company said.

The APC/5 Programmable Controller is said to be capable of testing the validity of programs before they are run on actual equipment, the company said.

The price for a typical system configuration consisting of an APC/5 Programmable Controller unit with color graphics programming device and 256 process I/O points, is \$50,000. An optional documentation device is available for another \$7,000, the vendor said.

Modcomp can be reached at P.O. Box 6099, 1650 W. McNab Road, Fort Lauderdale, Fla. 33310.

INSIDE

Auxiliary
Equipment/59

SYSTEMS & PERIPHERALS

CHUBA from page 57

companies (Burroughs Corp., Univac [Sperry Corp.], NCR Corp. Control Data Corp. and Honeywell, Inc.), so that IBM controls some 76% of the market today, according to the Gartner Group figures.

Chuba said IBM's large-systems marketing strategy includes announcing top-of-the-line models before low-end models to minimize the impact on sales of existing series, cutting prices to stimulate sales of existing lines when new lines are announced and offering customers the option of field-upgradability to realize the benefits of improved price/performance. "The field upgrade strategy serves as a type of competitive lockout," because it is often easier for users to upgrade than buy a plug-compatible product, he said.

As to frequent user inquiries about whether IBM will cut off upgrades of other models to force users to Sierra, Chuba said, "We think that's highly unlikely." IBM will be more likely to stabilize the price of upgrades, so that in years to come upgrades will not be as attractive as buying the new machines, he said.

Better price/performance

The Gartner Group expects that the Sierra will not be field-upgradable, but IBM will offer superior price/performance to entice users to Sierra, Chuba suggested. He predicted that Sierra will offer approximately \$200,000/one millions of instruction per second (Mips) price/performance in a minimum configuration.

The Gartner Group also predicted that succeeding the Sierra, perhaps in 1988, will be the Summit series, with price/performance closer to \$100,000/one Mips, Chuba said.

IBM has shipped 4,000 to 5,000 3080 series processors in the last three years and should ship 7,000 to 8,000 Sierra CPUs during its product life, Chuba said. Demand will fuel the increase, and IBM will be able to produce more Sierras than 3080 Model X series CPUs without adding manufacturing capacity, because Sierra will have fewer components, Chuba said.

An integrated array processor is possible in the Sierra, perhaps as an option, to appeal to science and engineering markets, Chuba said. The Gartner Group also predicted that the Sierra will feature main memory of up to 256M bytes and higher channel speeds.

"The important thing to realize about these features is that they probably will not all be there at the outset," Chuba said. IBM will try to downplay the differences between Sierra and the 3080 Model X series initially, to

preserve the market value of the Model X series. Gartner Group does not expect a low-end Sierra until 1986, Chuba said.

All these incentives will make Sierra attractive to users, "If not for what it offers now, then for what it offers potentially in the future," Chuba said.

Users of 4381s, in the absence of a low-end Sierra, will have the option of moving to the 3033s, Chuba suggested. Citing confusion in

the marketplace about how the air-cooled 4381s and liquid-cooled 3033s compare, Chuba pointed to the advantages of the 4381's lower price per Mips and the fact it requires less space in a data center. "From a price/performance standpoint — from many standpoints — the 4381 today is a much better buy than the 3083," he said.

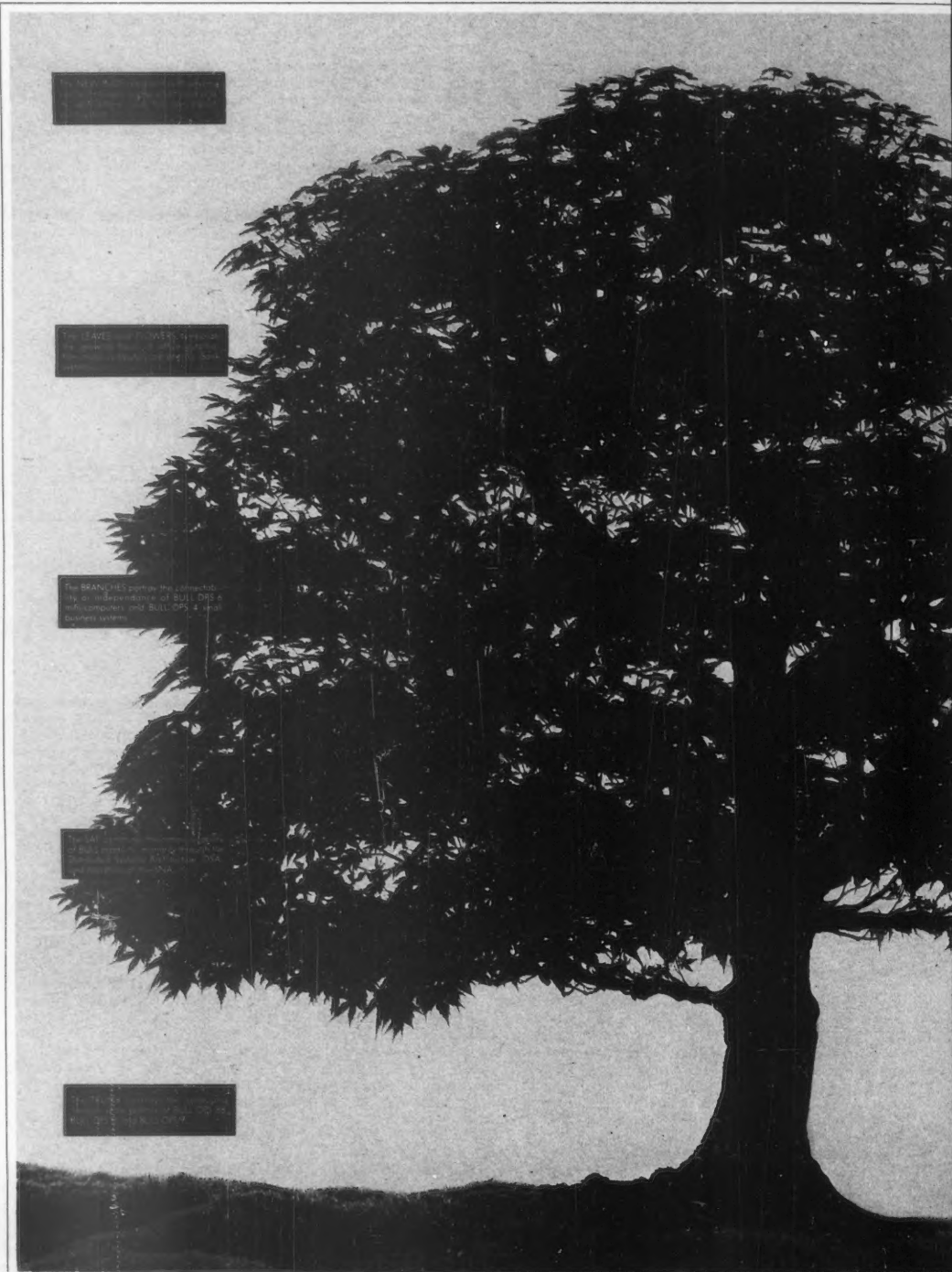
When 4381 users "run out of gas," the Gartner Group predicted that IBM will, in 1986, announce performance

improvements for the line or announce new models. But, "We don't see the 4381 family getting bigger in any significant way," such as with a quad-processor, Chuba said. Perhaps in 1987 or 1988, IBM will announce a follow-up air-cooled CPU to the 4381 family, he suggested.

For the approximately 8,000 4341 users in the U.S. market, the 4381 or 3083 is the upgrade path, Chuba said, adding that the Gartner Group expects that 90% of

4341 users will go to the 4381.

The decision for those users should be based on growth factors, he advised. Firms with over a 50% compound annual growth rate should migrate to the 3083, and firms with less than a 50% rate should consider the 4381, the Gartner Group advises. IBM may sell 8,000 to 10,000 4381s in the product's life, to make it one of their most successful CPUs, he suggested.



SYSTEMS & PERIPHERALS

PANEL from page 57

puter is 50 times faster than a general-purpose mainframe, he said.

Original intent

Stein suggested the original intent of the supercomputer designation was to distinguish the processors as a class of CPUs at the high end of the spectrum, positioned above mainframes. Supercomputing implies "maximum computing at minimum

cost," he suggested, acknowledging that any definition is likely to change in coming years.

Commenting on applications for supercomputers, Leiz said his company uses a Cray Research, Inc. supercomputer for structural and flow analysis, such as for air flow over an aircraft wing. Using a supercomputer, a wing structure can be modeled at one-fifth the cost of building a wing, he said.

McIntyre said that in engi-

neering analysis applications, more accurate models can be run with supercomputers. Models that run on 370 architecture may be too simplistic for certain uses, he said.

Stein summarized that applications for supercomputers today are those too large for existing mainframes.

Lower costs, better designs

Claunch said research and engineering costs can be low-

ered and designs can be improved as a result of supercomputer use. He said one aircraft manufacturer achieved a 20% lower aircraft operating cost as a result of using a supercomputer to help model performance.

Automakers may be able to achieve similar operating improvements, he suggested.

Supercomputers could be used for high-speed transaction processing and possibly for artificial intelligence ap-

plications, Stein suggested. The Japanese may be motivated to develop supercomputers by a desire to develop AI applications that U.S. companies are not pursuing, he theorized.

Software wars

"They [Japan] may perceive that as their secret weapon in the software wars," he said. "If the Japanese were successful in doing that, they could well be in a dominant position in the computing industry in as little as 20 years' time."

On the software issue, McIntyre said, "The machine is only as good as the software you have to exploit it." Scientific applications involving multiple CPUs linked in a parallel series are "fun to fantasize about" but not very useful in the practical world, he suggested. Getting jobs to run is what concerns users, he said.

With the exception of NAS and Amdahl hardware, most applications of supercomputers and array processors up to now have been for non-370 architecture for noncommercial purposes, according to Stein.

BULL COMPUTERS. THE TREE OF COMMUNICATION.

The tree of communication symbolizes BULL's total commitment to information systems.

As one of the leading international manufacturers of data processing and office automation systems, BULL offers competitive and innovative solutions to all your information management problems, whether special or general, always designed to meet the specific needs of your business.

Moreover, BULL has developed an unmatched know-how in designing communication systems in order to improve interaction at all levels and in any situation. The result: an enhanced competitive edge and a better return on your information and communication investment.

In terms of hardware, BULL offers a wide range, from micro-computers to large scale data processing systems, including distributed data processing and office automation. For BULL, high quality data processing necessarily includes the availability of a full range of constantly updated services, which are under continuous development. To this end, BULL cooperates closely at international levels with software houses, universities, research centers and other manufacturers.

Whether your organization is large or small, simple or complex BULL Distributed Systems Architecture (DSA) adapts to you and to your needs. It conforms to international standards (ISO) and has the inherent property of accommodating change. DSA is adaptable, flexible, and easy to use.

Strongly present in 74 countries, BULL is wherever you are. So why not let us plant your tree of communication... or help it grow?

Bull

AUXILIARY EQUIPMENT

DATAGRAPHIX, INC.
COM for Sperry Corp. 1100/
60-90

Datagraphix, Inc. has announced an on-line computer output microfilm (COM) capability for Sperry Corp. 1100/60-90 mainframes.

Users can choose from either of two cut-fiche on-line systems: the Autocom II recorder with self-contained chemical processing or the Aris II dry recorder, the company said.

Datagraphix on-line COM systems attach directly to all current Sperry Series 1100/60, 70, 80 or 90 CPUs.

The price for an on-line Model 2275 Autocom II is \$112,800, according to the vendor.

Datagraphix, P.O. Box 82449, San Diego, Calif. 92138.

IBM/38-36 INFO CENTER. TODAY! PC



Call or write for details on FUSION's Information Center. Includes integrated retrieval processor (report/queries), personal database and IBM PC Interface.

FUSION

FUSION PRODUCTS INTL.
(415) 461-4760
900 LARKSPUR L.C. #295
LARKSPUR, CA 94039
TELEX 176099

XEROX

Presenting the fastest, most versatile and most economical print shop in the world.

In short, the Xerox Electronic Publishing System.

A laser printing system so technologically advanced, it lets you create documents with a speed and quality that rival that of the finest outside print shop.

And what makes it so technologically advanced? A Xerox innovation called the Xerox Integrated Composition System (XICS). XICS is the software of electronic publishing. It lets you create print-shop quality, cover-to-cover documents from computerized text and scanned or computer-generated graphics.

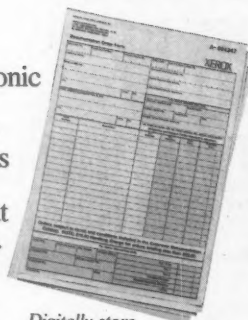
Which means you compose, paginate, format and store all your pages electronically.

And set type in your own choice of font style and size, as well as reproduce logos, signatures and graphics.

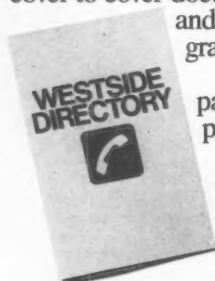
Then, using either our 9700 or 8700 Electronic Printers (or Model V versions), you print on both sides of ordinary, cut-sheet, 8½ by 11 inch paper and turn out documents at up to 120 pages per minute.

All sorted, collated and stacked automatically. So you get what you want, when you want it. And only as many sets as you need. Of course, you also get tremendous savings in production costs, warehousing and waste reduction.

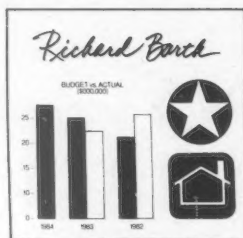
Not to mention increased flexibility to respond to customers' needs.



Digitally store customized forms.



Create and update company phone book.



Reproduce logos, charts and signatures.

For example, one company, a wholesaler of books to school libraries, used our system to offer customized catalogs with a personal choice of sequence and delivery dates.

The result... "Increased sales of over 400 percent."

A large energy company now produces a more accurate and timely telephone directory utilizing Xerox electronic publishing capabilities.

Another company, a leading manufacturer of PBX systems, used XICS to produce the 800 to 1,400 pages of documentation that must accompany each system—a job that used to take three to six months to complete.

They now do this documentation in tandem with new product development... "saving as much as a year's time in releasing a product."

The Xerox Electronic Publishing System is also part of Team Xerox—a wide array of products, people and services designed to meet your information needs.

If you want more information than this illustrated example provides, simply ask for our free 16-page Graphics Capabilities brochure. It will give you complete details on how the Xerox Electronic Publishing Systems work.

Just call Xerox Printing Systems, toll-free, at 1-800-556-1234, Extension 95. In California, call 1-800-441-2345, Extension 95.

ABCDEFGHIJ
abcdefghijklm
abcdefghijklmno
12345678910
ABCDEFGHIJKLMNQRST

Set type in choice of font style and size.

Team Xerox



The Xerox Electronic Publishing System.



MICROCOMPUTERS

IBM launches micro version of RS/1 package File transfer, graphics packages for 3270 Personal Computers also debut

WHITE PLAINS, N.Y. — IBM introduced a Personal Computer version of Bolt, Beranek and Newman, Inc.'s RS/1 analytical package along with 3270 Personal Computer application software earlier this month.

RS/1 provides technical professionals with a variety of analytical tools, IBM said. Functions are said to include data entry and retrieval, data transformation and analysis, graphics, curve fitting, statistical analysis and analytical models. RS/1 also provides the Research Programming Language, which permits users to extend and tailor the system's capabilities and to interface with other programs.

RS/1 runs under PC-DOS 2.0 or higher versions on an IBM Personal Computer with 512K bytes of random-access memory and a dual-sided disk drive and a 10M-byte hard disk drive. The software also runs on similar configurations of the Personal

Computer XT, Personal Computer AT, Personal Computer XT/370 and 3270 Personal Computer.

The \$2,000 package is scheduled for sale by Jan. 25.

IBM also launched the IBM 3270-PC File Transfer Express program, which runs on the 3270 Personal Computer and is said to permit transfer of any type of file between that machine and a host system. The host system may be supported by standard Distributed Processing Control Executive/Distributed Office Support Facility or Distributed Processing Programming Executive/SP2 in an IBM 8100 or by appropriately coded customer-supplied System/370 software. Available this month, the program will cost \$75.

In addition, IBM noted that it has shipped the 3270 Personal Computer/G and 3270 Personal Computer/GX and introduced the 3270-PC Color Graphics Ap-

plications program for those two machines.

The program consists of Graphics Editor and Picture Plotting components. The Graphics Editor reportedly enables users to create, modify, file and retrieve pictures and to display, edit and file pictures generated in the Picture Interface Format (PIF). The Picture Plotting software is said to give users the ability to plot Graphics Editor output or other PIF files. The software is scheduled for April shipment and is priced at \$395.

Finally, IBM said its 7371, 7372, 7374 and 7375 color plotters now support the Models AT and XT, Portable Personal Computer and Personal Computers equipped with the General Purpose Interface Bus, except for the PCjr.

IBM National Accounts Division is located at 1133 Westchester Ave., White Plains, N.Y. 10604.

INSIDE

Software/64

Systems/68

Communications/69



SMALL TALK

Eric Bender
CW Senior Editor

IBM AT shipped before its time, many users say

Offhand, there's little resemblance between the Osborne Computer Corp. Osborne I and the IBM Personal Computer AT.

Introduced in 1981, the Osborne I was based on the then-ubiquitous Zilog, Inc. Z80 microprocessor and featured an oscilloscope-like 5-in. screen and ultralow-density floppy disk drives in a transportable package. The AT, built around Intel Corp.'s hotshot 80286 chip, comes with high-density floppy and hard disk drives and stoutly resists the trend toward taking a smaller footprint on a desk.

But there are curious parallels in the early customer histories of the two machines.

Both generated tremendous excitement when announced, both immediately began to carve out new territory for personal computers, and both also soon showed that they had shipped before they were ready.

"Any seasoned manufacturing executive would have deemed the Osborne I, when first shipped, to be in its preproduction stage," Osborne founder Adam Osborne later acknowledged in *Hypergrowth*, his book detailing the company's rise and fall. While other factors crippled the company, manufacturing difficulties plagued Osborne right up to the moment the firm filed for Chapter 11 protection under the Federal Bankruptcy Act.

IBM now has tens of thousands of Personal Computer ATs out in the field, and many reports have a curious ring of familiarity. Once again, the machines sound like beta versions. This time, how-

See AT page 69

Lattice unveils debugging tool

GLEN ELLYN, Ill. — Lattice, Inc. recently introduced C-Sprite, a debugging tool for software programs written in Lattice C or assembly language.

C-Sprite, which runs under IBM's PC-DOS or Microsoft Corp.'s MS-DOS Version 2 or 3, reportedly features Help screens, macros, command files, conditional commands and debugging through a communications port.

The software operates on COM or EXE files made up of object modules produced by the Lattice C compiler or Microsoft assembler, Lattice said. C-Sprite is said to provide a high-level view of C programs

via function names, line numbers, variable names and C data types. It also reportedly gives a low-level view of machine addresses and instructions for testing assembly language functions or for microscopic examination of compiler-generated code.

Program behavior is monitored by planting break points, examining registers and variables and single-stepping if necessary, according to the vendor. Variables, registers and program instructions can be changed at any time, Lattice said.

C-Sprite will be available next month for \$1,175. Lattice can be reached through P.O. Box 3072, Glen Ellyn, Ill. 60138.

In-house tech writers guide novice users

By S.L. Dean
Special to CW

Most personal computer hardware and software manufacturers make a real effort to provide sufficient information to use their products. However, many of them don't seem to realize that the secretary, accountant, vice-president or maintenance chief expected to use this new tool has never run a computer, is unfamiliar with the equipment and, quite possibly, did not wish for a computer at all.

To begin with, the new users are presented with the computer, peripherals, chosen software and a number of manuals.

The manuals theoretically contain sufficient information to allow the new user to learn whatever is needed. In some cases, this may be true. However, in the case of the truly novice computer user, even the words "peripherals" and "software" probably are unintelligible. Such a person is completely lost trying to cope with the intricacies of computers.

Some companies are perfectly willing to provide opportunities for staff to learn programs. Particularly in the case of the more complex programs, such as Lotus Development Corp.'s 1-2-3 and Micropro International Corp.'s Wordstar, the company may be willing to send

See WRITERS page 72

Conetic Systems adds desktop package

SAN LEANDRO, Calif. — Higgins, an "administrative assistant" software package for managers and knowledge workers, was introduced here this month by Conetic Systems, Inc. Designed for the IBM Personal Computer XT and compatible machines, the program is available in single-user and local-area network versions.

Unlike other microcomputer desktop organizing packages, Higgins offers expense reporting, multiuser local-area network support, phone message and electronic memo functions and the ability to track each item's relationship to everything else in the system, Conetic Systems said.

The package reportedly offers nine fully integrated modules built around a common data base: time manager, telephone directory (with autodialing and related capabilities), things-to-do list, personal filing, calculator, expense report, scratch pad, clock and tickler reminder. Higgins also is said to feature global information retrieval, note writer, keyword links to external programs, macros, customized reports and context-sensitive on-line Help.

The multiuser version of Higgins currently supports up to seven users on personal computer networks supplied by 3Com Corp. of Mountain View, Calif., and No-

See HIGGINS page 69

your DEC-comp
simplified image



atible terminal projects even when it's off.

The WY-75 is the one VT-100 software-compatible terminal that looks intelligent even when it's not on.

And at \$795, it looks as smart to the people who pay for it as it does to the people who look at it all day.

Like all our terminals, the WY-75 combines an unusually small footprint with a very generous 14" diagonal display. The non-glare screen tilts, swivels, and displays a full 132-column format. The sculpted, low-profile keyboard adjusts, too.

We've done everything to make the WY-75 the best looking, best feeling, best performing terminal anywhere. On or off.

Can such a beautiful piece of equipment be the workhorse we say it is? Try it, hands on, and see your application software on the screen.

To find out where you can see the WY-75 demonstrated, call the regional office nearest you.

For more information about our complete line of products, write or call Wyse Technology.
3040 N. First Street, San Jose, CA 95134.
(408) 946-3075. Outside of California
800-421-1058.

WYSE

MICROCOMPUTERS

SOFTWARE

SOFTWARE STUDIOS, INC.
PC-Desk

Software Studios, Inc. has announced PC-Desk, a desk management system that runs on an IBM Personal Computer with IBM's PC-DOS operating system.

The program is said to include an integrated address and telephone file, a calendar, a calculator and an automatic telephone dialer. PC-Desk will merge letters with addresses and print labels, stickers, an alphabetized phone directory and a log of system use, the vendor said.

The text of a letter reportedly may contain four variable fields including a person's name, company name, expiration date and a free-form field that the user designs.

PC-Desk costs \$49.95 plus \$2 for shipping.

Software Studios, 8516 Sugarbush Court, Annadale, Va. 22003.

QUALITAS, INC.
Tall Screen

Qualitas, Inc. has announced Tall Screen, a utility for IBM's PC-DOS operating system that stores up to 1,000 lines of PC-DOS output for review and editing.

With Tall Screen, a user can recall any previous command or string of commands with a single keystroke, the vendor said. The utility reportedly allows a block of text to be written to a file, printed or frozen on a screen. A user reportedly can edit any text on a screen and use custom keystroke sequences.

Tall Screen requires IBM PC-DOS 2.0 or higher, and an 80-col. screen is recommended. It is priced at \$49.95.

Qualitas, P.O. Box 3AK/UPB, Las Cruces, N.M. 88003.

RATIONAL SYSTEMS, INC.
Instant-C

Rational Systems, Inc. has announced Instant-C, a C language interpreter available for microcomputers running IBM's PC-DOS, Microsoft Corp.'s MS-DOS and Digital Research, Inc.'s CP/M 86 operating systems.

Instant-C is said to implement standard C features so programs developed with Instant-C can be moved to other systems. A built-in screen editor displays source code errors and provides diagnostic messages, the vendor said.

The product reportedly includes break points, single-stepping by line of source code or function call and evaluating expressions.

Instant-C costs \$500.

Rational Systems, P.O. Box 480, Natick, Mass. 01760.



"Your flexible screen mount doesn't seem to be working."

MICRO SOLUTIONS, INC.
Uniform-PC

Micro Solutions, Inc. has introduced Uniform-PC, a utility that transforms diskettes created under Digital Research, Inc.'s CP/M operating system so they can be used with IBM's PC-DOS operating system.

The product transforms one IBM drive into a CP/M drive capable of reading, writing, formatting and copying diskettes, the vendor said. Standard Ascii files and other files reportedly can be moved between operating systems without altering the integrity of the file.

Menu-driven commands reportedly help the first-time user work with Uniform-PC. When the user is familiar with the product, all commands can be entered with a single-line entry from a PC-DOS prompt, Micro So-

lutions said.

Uniform-PC costs \$69.95.

Micro Solutions, 125 S. Fourth St., DeKalb, Ill. 60115.

LAYERED, INC.
Front Desk

Layered, Inc. has introduced Front Desk, a time and resource manager that runs on Apple Computer, Inc.'s Macintosh microcomputer.

The product reportedly integrates scheduling for personnel and resources and analyzes project productivity and revenues, the vendor said. Front Desk is said to provide scheduling for up to 15 people or other resources.

The software provides reports on assignments for any or all people for a single day, week or day of the week or month. Front Desk keeps a history

of the previous three months and schedules appointments for up to 10 months in advance, Layered said.

Front Desk costs \$149.95.

Layered, 85 Merrimac St., Boston, Mass. 02114.

STOK SOFTWARE, INC.
Backrest enhancements

Stok Software, Inc. has enhanced Backrest, a utility for backing up hard disks on microcomputers running Microsoft Corp.'s MS-DOS, IBM's PC-DOS, Digital Research, Inc.'s CP/M and Musys Corp.'s Turbodos operating systems.

The enhancements include the ability to interrupt a backup at any time to perform another task or to format a floppy disk, the vendor said. Other additions include the ability to lock out bad sectors on hard

The computer for companies who want everything.

Before you buy another computer system, listen to every department in your company. You don't need a lot of different computers to solve all their problems... just one family of versatile Prime® computers.

"Instead of one computer for design, one for database management, and one for text processing, why can't we get all our engineers to use a single system?"



"Before I put one more computer on the shop floor, I want one powerful system that puts it all together reliably: inventory control, shop scheduling... even shipping!"

"This company's marketing decisions are too big for one little spreadsheet. I need total decision support if I'm going to meet my revenue goals. And I need it now. Or after lunch, at the latest."

MICROCOMPUTERS

disk, optional restoration to an alternate drive and support of file-oriented tape backup devices, according to the vendor.

The program includes a menu-driven installation program.

Backrest costs \$180.

Stok Software, 17 W. 17th St., New York, N.Y. 10011

WORDTECH SYSTEMS, INC. Db/Index, Db/Debugger

Wordtech Systems, Inc. has introduced two utilities for users of Ashton-Tate's Dbase II data base management software.

Db/Index is a library of routines said to provide faster indexing, sorting and packing of Dbase II data files. It also includes a program that can repair some damaged data bases, the vendor said.

The Db/Index routines can be operated as stand-alone modules, or they can be called from Dbase II programs. The utilities reportedly can be used on microcomputers utilizing Microsoft, Inc.'s MS-DOS, IBM's PC-DOS or Digital Research, Inc.'s CP/M 80 and CP/M 86 operating systems. It is priced at \$120.

Db/Debugger is a symbolic debugger for programs written in the Dbase II programming language. It is said to eliminate the need for Dbase II in program development and testing and to complement the vendor's Db/Compiler product.

Db/Debugger is said to enable programmers to set execution break points by file and line, automatically enter debugging mode after a runtime error, list and modify memory variables and data base items, list Dbase source code from any file and

any number of lines and invoke an on-line help menu.

The utility, which runs on the same machines as Db/Index, is priced at \$240.

Wordtech Systems, P.O. Box 1747, Orinda, Calif. 94563.

LANTECH SYSTEMS, INC. Integrated/Office Series

Lantech Systems, Inc. has announced the Integrated/Office (I/O) Series, a collection of microcomputer applications for use under Unix 2.0, the latest version of Lantech's AT&T Unix-compatible operating system.

According to a spokesman, the I/O Series provides a multitasking, windowed environment for Lantech's office automation application packages. The packages include

Powerlink 100, an asynchronous communications program; IF, an integration facility; and PC-DOS Emulator, which allows the system to support most IBM PC-DOS applications.

The product reportedly combines a window-to-window transfer mechanism that can learn a long series of keystrokes or commands to automate repetitive tasks, such as entering spreadsheet data. The Powerlink 100 package is said to link IBM Personal Computers or compatibles to any host computer that can support a standard Digital Equipment Corp. VT100 terminal. With IF, Powerlink allows a user to transfer data from an application running on a minicomputer or mainframe directly into a local application.

The Unix operating system with windowing costs \$249. Powerlink 100 and PC-DOS Emulator are priced at \$50 each, and IF is priced at \$100.

Lantech Systems, 9635 Wendell Road, Dallas, Texas 75243.

POC-IT MANAGEMENT SERVICES, INC. Microman

POC-IT Management Services, Inc. has introduced a microcomputer-based project management system for information services departments and software development groups.

Microman is designed to run on an IBM Personal Computer or compatible under IBM's PC-DOS or Microsoft, Inc.'s MS-DOS Version 2.0 or later operating systems. Features include work load control, project planning, management reporting and monthly financial report functions.

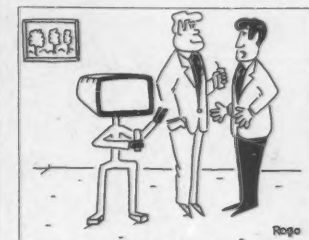
The price of Microman is \$5,000.

POC-IT Management Services, Suite 606, 606 Wilshire Blvd., Santa Monica, Calif. 90401.

PARLAY SOFTWARE CORP. Quota:100

Parlay Software Corp. has announced an integrated sales organization management system for IBM Personal Computers and compatibles running under Microsoft, Inc.'s MS-DOS operating system.

Continued on page 68



'Pretty clever bringing in a host computer.'

Data General

- SYSTEMS / ADD ONS
- LOCAL FIELD SERVICE
- NATIONAL DEPOT REPAIR
- UP TO 60% OFF LIST
- ALL CABLES

BUY • SELL • LEASE

PINZONE INTERNATIONAL
214-780-1600 713-351-7982
1102 So. Cedar Ridge 701 Broadway
Duncanville, Texas 75117 Chicago, Illinois 60621

PRIME is a registered trademark of Prime Computer, Inc., Natick, Massachusetts.

"Don't tell me about applications backlog... my receivables are aging! I need a comprehensive accounting system that uses all our data, from branches around the world."

"I'm building an information system for the whole company. That means real compatibility. User-transparent communications between all departments. And plenty of proven software."

"I want everything they want. And I want it all from an established company that's going to be around tomorrow."



You can do more with a Prime system. We're a Fortune 500 company with worldwide support. With a family of high-performance computers so compatible, you can interchange hardware and software. With complete networking and communications. And with over 1,000 software solutions, for every imaginable need.

PRIME
Computer

Find out what you can do with our versatile systems. Call 1 800 343-2540 (in Mass., 1 800 322-2450) or your local office. Or write: Prime Computer, Prime Park, MS 15-60, Natick, MA 01760. In Canada: 416-678-7331; Prime Computer of Canada Ltd., 5945 Airport Road, Mississauga, Ontario, L4V1R9 Canada.

We're versatile, so you can do more.

**Sooner or
later, you'll have
to face
this computer
problem.**

PC MAGAZINE • MAY 15, 1984

Do your eyes itch, burn, or tear? Are they tired and sore? Do you get headaches, occasional dizziness, or blurred or double vision? If you have any of these symptoms, you're probably suffering from eyestrain and fatigue, and it may be from using your PC.

Eye fatigue and other vision problems are common for regular users of PCs and other kinds of video computer displays. This visual stress can also contribute to general tension and tiredness. Fortunately, the vision problems experienced by video display users have

Better sooner.

Better Sooner.

Computers don't ever get headaches.

But the people who use computers do.

Quite clearly, as PC Magazine spells out, that's not the only trouble they're having.

In case you're tempted to dismiss this as trivial, there are two things you should be aware of:

First, more than twenty states are already preparing legislation to force some improvements.

Second, if computer users suffer, so does business.

Because computers are only as fast and accurate as the people who operate them.

You are not a machine.

Computers are designed by engineers.

They usually know a lot about technology but very little about people.

Which is why so many computers are technically impressive but strangely unnatural to use.

Computers Induced Musculoskeletal Problems (%)	
Eye strain	55%
Back pain	43%
Headaches	30%
Shoulder	25%
Hand/wrist	18%
Neck pain	15%
(Source: "Ergonomic Principles in Office Automation" Pub. 1983 by E.I.S. AB, Sweden.)	

Ericsson, in its very Swedish way, has always believed that excellent ergonomic design isn't a privilege.

It's a right.

That it isn't a noble gesture

but demonstrably good for business.

It's an attitude that has made Ericsson No. 1 in Europe twice over:

First, as the giant of European telecommunications.

Then again as Europe's biggest workstation company by far.

(You couldn't ask for a better marriage of technology for the future.)

Here is one example of how they got there.

It's the first of a whole range of computers to be introduced in the U.S.A.

IBM is a trademark of International Business Machines Corp.

The Ericsson P.C. It's Ergo-Intelligent."

Ericsson has spent \$300 million finding ways to make people and computers work better together.

Here are some of the results.

Ergo-Screen."

Aspirin gets rid of a headache. Ergonomics gets rid of the cause.

The Ericsson PC monitor has a non-glare screen.

With restful amber characters on a specially developed, low-fatigue background color.

Even the shape of the actual characters was specially developed to allow easier recognition of difficult to distinguish letters like O and Q.

On the monochrome monitor, the resolution is double that of IBM's, so clarity is remarkable.

You can even have characters and graphics on the same screen.

Ergo-Arm."

Thousands of people get neck and muscle pain from inadequate height and angle adjustment. The Ericsson Ergo-Arm lets you move your screen exactly where you want it.

Better than back pain, wouldn't you agree?

Ergo-Touch."

The keys are full-size and the layout is ergonomically planned for greater accuracy and speed.

Yet the keyboard is 20% more compact and less than half the weight of IBM's.

Even the cord is adjustable to suit left- or right-handers.

Ergo-Color."

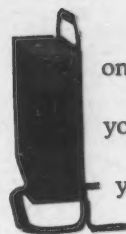
Even the color of the case is ergonomically selected to be restful to the eye over many hours.

Ergo-Space."

The system unit is one-third smaller than IBM's.

It even fits under your desk in a vertical rack.

So your desktop is your own again.



IBM Compatible.

Many companies claim to be compatible.

Some are. Some are stretching the truth.

The Ericsson PC boasts the highest compatibility rating there is.

It's operationally compatible.

You can take advantage of thousands of PC-compatible programs already available.

In fact, with the best-selling software, the program and data disks are interchangeable with those of the IBM PC.

Service. Not Excuses.

Ericsson wouldn't give you anything less than on-site or carry-in service. The choice is yours.

3 Free Offers.

Ericsson will send you revealing literature on ergonomics.

Also a detailed brochure on the Ericsson P.C.

And arrange a hands-on test if you ask for it.

Call toll-free 1-800-FOR-ERGO.



ERICSSON



MICROCOMPUTERS

Continued from page 65

According to the vendor, the Quota:100 system includes modules for order processing, confirmation processing, commissions, receivables and sales analysis.

The price of Quota:100 including program diskettes, user manual, function-key template, tutorial and unlimited telephone support for the first month of use is \$2,995.

Parlay Software, 4651 Westgrove Drive, Dallas, Texas 75248.

AMERICAN SOFTWARE, INC. Forethought

American Software, Inc. has announced Forethought, a microcomputer version of its mainframe product group and item forecasting system.

Forethought is a forecasting package for plants and offices. The product provides monthly and yearly forecasts, multiforecasting and item forecasting with up to two item groupings and statistical forecasts with management overrides and simulation capability, the vendor said.

The package runs on an IBM Personal Computer with IBM's PC-DOS operating system.

Forethought costs \$9,500.

American Software, 443 E. Paces Ferry Road, Atlanta, Ga. 30305.

SYSTEMS

ALPHA MICROSYSTEMS, INC. AM-1100E

Alpha Microsystems, Inc. has announced AM-1100E, a desktop microcomputer that runs Alpha's Unimos, a multiuser operating system capable of supporting 11 users.

Unimos is a version of AT&T's Unix System V and supports Unix versions of programming languages such as C, Cobol, Fortran and Basic, according to the vendor.

The microcomputer features a Motorola, Inc. 68010 microprocessor, 1M byte of random-access memory, a 30M-byte hard disk drive, three serial ports (expandable to 11 ports) and a 40M-byte streaming tape backup, the vendor said.

AM-1100E costs \$15,585.

Alpha Microsystems, 17332 Von Karman Ave., Irvine, Calif. 92714.

COMMUNICATIONS

TECMAR, INC. Powerlink

Tecmar, Inc. has announced Powerlink, a microcomputer-to-mainframe communications board for the IBM Personal Computer.

According to a spokesman, Powerlink is designed to emulate IBM 3278 and 3279 terminals that access an IBM mainframe system. The emulations allows a user to access IBM 3270 applications on the mainframe while concurrently running Personal Computer applications. File transfer software enables the micro to access and move large mainframe data bases to the micro. The files can be viewed and manipulated and then transferred to the mainframe or stored on the micro, the vendor said.

The interface board features direct memory access for rapid screen updating, and file transfer is en-

hanced with batch file support capability, according to Tecmar. Powerlink also features a windowing capability that allows the user to view one host session containing information from a mainframe, one IBM PC-DOS session from the micro and two electronic notepads, the vendor said.

Powerlink is priced at \$1,099.

Tecmar, 6225 Cochran Road, Solon, Ohio 44139.

The Software Store Mastercom

The Software Store has announced Mastercom, a smart terminal and file transfer utility designed for microcomputers running Digital Research, Inc.'s CP/M 80 or Microsoft Corp.'s MS-DOS operating systems.

The product reportedly can con-

nect a terminal to a host time-sharing system, capture data on disk or printer and transfer files with error-correcting protocols.

Mastercom is said to feature directory display, multiple file transmission, file erase, file rename, disk drive logging, automatic dialing, stored responses recalled with single keystroke and file viewing.

Mastercom costs \$49.

The Software Store, 706 Chippewa Square, Marquette, Wis. 49855.

TRIPAS TECHNOLOGIES, INC. PC Trilink

Tripas Technologies, Inc. has announced a personal computer integration board that reportedly links the IBM Personal Computer, Personal Computer XT or Personal Computer XT-compatible systems with asyn-

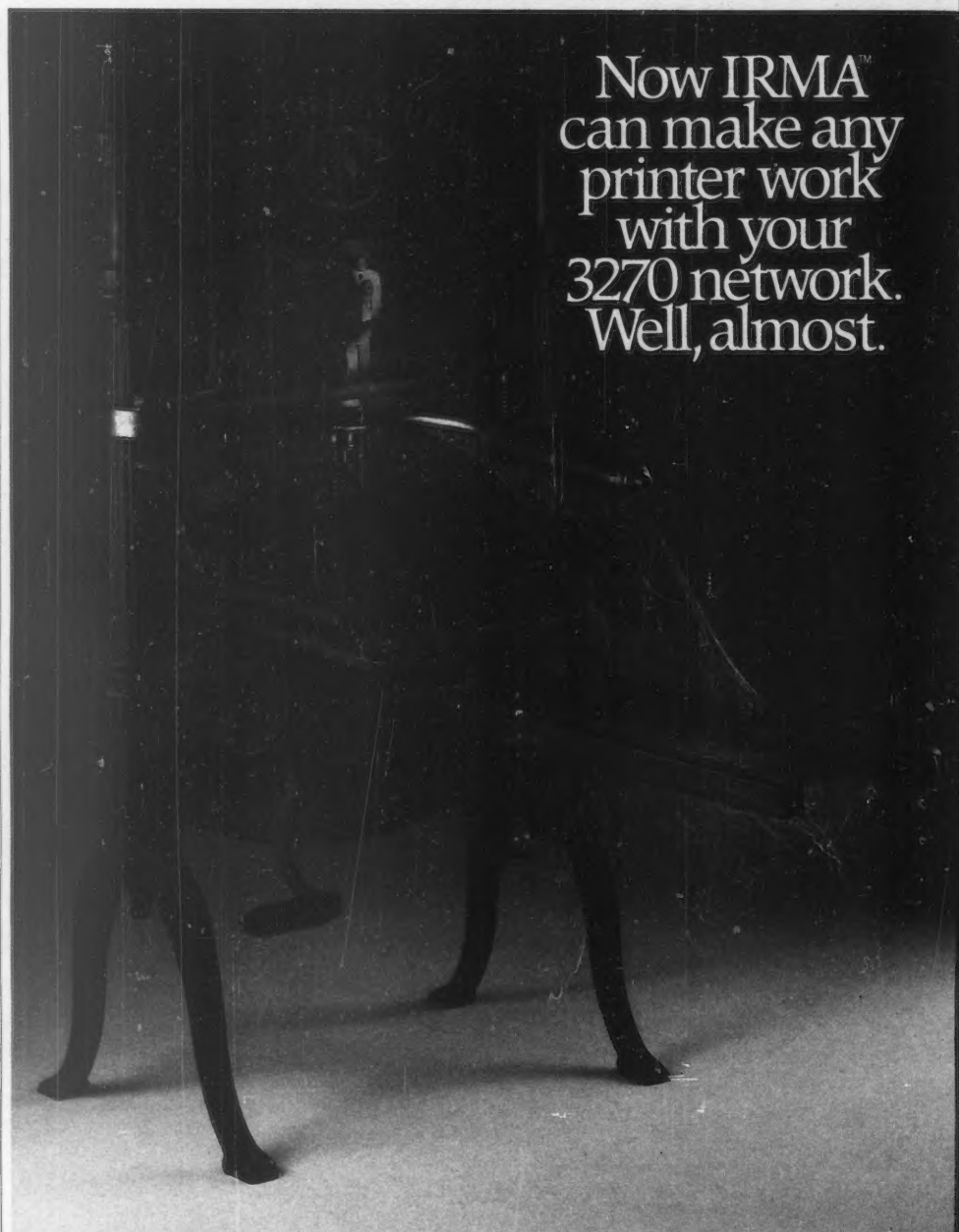
chronous terminals and networks.

Trilink is said to give most asynchronous terminals, including Digital Equipment Corp. VT100 terminals, Personal Computer capability without disrupting any element of the existing data processing network. No changes are required to the terminal, host computer or Personal Computer, the vendor said.

The board, which is directly plugged into any expansion slot in the Personal Computer, Personal Computer XT or compatible, allows users to operate asynchronous terminals as monitors on the microcomputer or directly as network terminals, the vendor said.

Trilink is built around a Zilog, Inc. Z80 microprocessor design and operates from two RS-232 interface ports for host and terminal connections. It uses nonvolatile memory to store

Now IRMA[™]
can make any
printer work
with your
3270 network.
Well, almost.



MICROCOMPUTERS

configuration data, as well as up to 32K bytes of random-access memory, the vendor said. Up to 8K bytes of read-only memory are available for the firmware, the vendor said.

The board is priced at \$495. Tripas Technologies, 37053 Cherry St., No. 203, Newark, Calif. 94560.

NETWORK SOFTWARE ASSOCIATES, INC.

Communications emulators for IBM Personal Computer AT

Network Software Associates, Inc. has announced that its line of micro-computer-to-mainframe communications emulators is now available for the IBM Personal Computer AT.

Products now available for the Personal Computer AT include Adapt SNA 3270, Adapt SNA Printer and Adapt SNA RJE, all of which report-

edly emulate IBM terminal products in an IBM Systems Network Architecture (SNA) environment. A fourth product, Adapt BSC 3270, is said to emulate an IBM 3270 terminal in a bi-synchronous environment.

The vendor said a main feature of the Adapt series is that the emulators work in conjunction with IBM's existing Synchronous Data Link Control (SDLC) or Bisynchronous Adapter Card for the Personal Computer.

The emulators require IBM's PC-DOS 2.0 or a later version, 192K bytes of memory and an SDLC or Bisynchronous Adapter Card. Prices are \$325 for the Adapt SNA-RJE and \$275 for Adapt BSC 3270. Adapt SNA 3270 and Adapt SNA Printer are sold together for \$325.

Network Software Associates, 19491 Sierra Soto, Irvine, Calif. 92715.

HIGGINS from page 61

vell, Inc. of Orem, Utah. Releases are planned for other networks as well, said Marketing Vice-President Howard Case.

Keeping files private

The network version reportedly includes phone message and electronic mail functions and allows each user to keep any contents of Higgins' files private.

The initial release does not permit two users to view a record simultaneously "because we were not willing to commit to a record-locking technique until IBM announced its network," Case noted.

A second release will provide this feature, he added.

Selling at \$395 for a single-user version, Higgins requires a Personal

Computer XT or compatible system with 256K bytes of random-access memory and IBM's PC-DOS or Microsoft Corp.'s MS-DOS 2.0 or above. The package also runs on the Personal Computer AT.

Pricing for the network version is based on the number of users, with customers buying a single copy and distributing it over the network.

A version supporting up to seven users will cost under \$1,500, Case said.

Conetic Systems is based in Portland, Ore. More information on the network is available from the company's Office Automation Group, which offers Higgins, at 1470 Doolittle Drive, San Leandro, Calif. 94577.

AT from page 61

ever, not only individual users but vendors, DP staff and other computer professionals are complaining of flaws.

"We've got four in, and three are bad," noted one micro manager at a Fortune 1,000 firm. In addition to power supply malfunctions, "the disk drives are flaky," he said. "The half-heights [floppy drives] are very temperamental, even when they are working, and the hard disks have problems too." The hard disk drives are likely to be damaged in shipment because IBM neglected to fully emphasize the complete preshipment procedures, he said.

The manager also described the AT as a good machine overall and said that he expects IBM to quickly fix the product flaws, improve documentation, supply a full range of related equipment in quantity and boost support in general. His firm currently intends to buy more ATs for specialized applications such as computer-aided design.

Many other DP/MIS executives also gave lukewarm reviews to the AT in its current incarnation.

"For some applications, we like it, and we're beginning to buy it," said Ronald Jenks, director of information services at Touche Ross and Co. in New York.

But, like others, his firm is not yet buying the AT for general use.

"We're holding off, waiting for some of the weaknesses to be fixed," he said.

Volkswagen of America, Inc. in Warren, Mich., which originally considered replacing Personal Computer XT orders with purchases of the new machine, is also postponing acquisitions, according to information center manager Warren Kress. "We're experimenting with two units, trying to identify the glitches."

Unlike the case with Osborne, everyone expects IBM to solve the AT's problems quickly and thoroughly. But until that happens, the next generation machine won't reach hyperspeed.



When you set up an IBM® 3270 network, you're faced with the fact that you can't just go out and buy any printer to work with it.

Your choices are, to say the least, limited. Even IBM only makes a few that are compatible.

But with new IRMAprint from DCA, the limits are off.

IRMAprint isn't a printer. It's a printer emulator. In technical terms, it hoodwinks the IBM mainframe into thinking that whatever printer attached to it is a 3287.

So now if there's a more economical printer you want to use, use it. If you'd like to plug in a laser printer, plug it in. If you've always wanted to upgrade to a printer with better capabilities, there's never been a better time than now.

You would think that, with all that it does, installing an IRMAprint might prove to be a headache.

It's not.

IRMAprint is installed right at the controller site with a simple standard coaxial cable. And two models of IRMAprint are available for either an RS-232C or Centronics® Parallel Interface.

IRMAprint. It's new from DCA, the makers of the IRMA family of IBM-emulation products.

It lets you choose any printer that's right for the job, instead of the few that are right for the network.

For more information about IRMAprint, or any of the IRMA family of IBM-emulation products, send in the coupon below. Faster still, call 1-800-241-IRMA. Telex 261375 DCAATL.

Mail to 303 Technology Park, Norcross, GA 30092. And we'll tell you more about IRMAprint and all IRMA products.

Name _____
Firm _____ Title _____
Address _____
City _____ State _____ Zip _____
Phone _____



MP-02-08

IRMA and IRMAprint are trademarks of Digital Communications Associates, Inc. DCA is a registered trademark of Digital Communications Associates, Inc. Centronics is a registered trademark of Centronics Data Computer Corp. IBM is a registered trademark of International Business Machines Corporation. © 1984, Digital Communications Associates, Inc.

OEM license for UNIX CAD SYSTEM



- Special applications needing CAD interface for internal company use.
- Vertical market applications by commercial software developers.
- Stand-alone or specialized drafting/design system for computer manufacturers.

ALGOR QUALITY PERFORMANCE SERVICE

Essex Square, Pittsburgh, PA 15206 • 412/661-2100



**Hewlett-Packard
presents the PC system
that lets you**

**figure
the figures,**

**plot the
graph,**

The key word in that long, drawn-out headline is system.

A system built for PCs.

At Hewlett-Packard, it's a quality system of personal computers, plotters, a truck-load of software, and Local Area Network (LAN) capability.

It's all matched and designed to work brilliantly together.

Yet the system is so flexible each part can stand alone. Or even team with an IBM PC.

So you can build just the system your staff needs.

It all starts with two of our Hewlett-Packard personal computers.

We call one the HP Touchscreen and the other (because it can do even more) the HP Touchscreen MAX.

The first comes with two double-sided disc drives that give you 256K bytes of main memory, expandable to 640K bytes.

The HP Touchscreen MAX has even more capacity, with the added power of a 14.8M byte Winchester disc drive.

And both have DSN/Link, to let you set up a direct line of communication between them and your HP 3000 Department Computer.

As the names imply, you can actually change things on either screen just by touching the screen.

That makes the Touchscreen PCs easier to use. And a lot easier to learn.

The system also includes two print-

ers many people think are simply the best around.

Our Hewlett-Packard LaserJet and ThinkJet printers are both breathtakingly fast and refreshingly quiet.

The ThinkJet printer runs at a rapid 150 characters per second.

Yet because the ThinkJet paints each character with a small jet of ink (instead of smashing the paper with keys), it's as quiet as a sigh.

At 300 characters per second, our LaserJet printer is even faster.

Ten times faster than the best daisy-wheel printers. Yet the image is as sharp as you'll get from a printing press. Amazing.



print
the report

and when you get to your hotel, change everything.

Two different plotters are also part of the HP personal computer system.

Both create full-color graphics. One with two pens, the other with six for even more detail.

If you like, the system can be knitted together through a LAN.

It lets a number of HP personal computers link up, talk to each other, share printers, and exchange information.

By the way, there can be a lot of information to exchange. That's because there are more than 500 business software titles available. For word processing, accounting, spread sheets and graphics. You'll find the big names there, too.

1-2-3[®] from Lotus[®] *WordStar[™] *** MicroPlan[™] *** And the whole catalogue of soft-

ware from HP.

Finally, when you travel, you can take the system with you.

Hewlett-Packard's portable personal computer turns your hotel room (or your den at home, or your customer's desk) into another part of your personal computer system.

The Portable has plenty of capacity; 272K bytes of RAM and 384K bytes of ROM. And with its built-in modem, it can link you with your office printers and plotters. Not bad for a computer that weighs just nine pounds and can fit into a briefcase.

The system is all linked up, all on the same programs, all designed to work together, and all ready to go.

And all from Hewlett-Packard.

Just dial 800-FOR-HPPC, toll free, to find the name of a Hewlett-Packard dealer or sales representative near you.



**HEWLETT
PACKARD**

MICROCOMPUTERS

WRITERS from page 61

staff to outside classes. Other companies will have one employee trained and then allow that employee to train others.

These methods will work, of course. Most people can learn to use a computer to perform the job in question if given sufficient incentive and training.

Unfortunately, because of the complexity of the programs, it can take many hours of unproductive attempts before a computer novice learns enough to be effective.

Still more time will be wasted if the person does not know a few basic rules of computer usage. For example, few novices know that a disk is magnetic, and that exposure to magnetic fields can destroy the disk's contents.

An in-house technical writer can help bridge this communications gap.

Businesses often employ a staff writer, whose job may be anything from creating brochures or newsletters to writing technical product descriptions. With training and experience, these writers can become technical writers, creating simple instructions that will ease the transition to computer methods. In particular, technical writers can be of invaluable assistance to novice users.

Getting started

To get started, the writer first must have access to the computer and the software and time to become familiar with both. If the writer previously has done no technical writing, he might enroll in a local technical writing course.

Once familiar with the hardware

and software, the technical writer can begin creating simple sets of instructions.

A good technical writer, faced with educating a novice user about a computer, will not assume anything.

Computer installation

The writer first should know if the computer is completely installed and ready for use or if the user must perform this task. If the user is expected to install the computer, then the technical writer can take the manufacturer's installation instructions and simplify them into steps. For example:

■ **Step 1.** Find the packing slip and check to be sure you have all the parts that are listed. If any are missing or seem different from the list, call vendor department, person and so on.

■ **Step 2.** Be sure the desk (table) for the computer is near an electrical outlet. Carefully unpack the display screen, keyboard, disk drives and printer. You will also find two cables, labeled (A and B). Next, look at the display page in the owner's manual. Note that the screen is placed on top of the disk drives, the keyboard is in front of them and the printer is to the side. (You may place the printer on either side.)

Simple lists

This example may seem too simple, but when a user unfamiliar with the electronic equipment needs to get it working, it is easier to follow such simple lists than to try to find the proper page in the manual and then interpret more intricate instructions. Also, novices are less intimidated by instructions from a person than from a manual.

Once the computer is hooked up, the technical writer can then instruct the new user to:

■ **Step 1.** Find the disk labeled 'System Master.' (It should be in the back of your owner's manual.) Note the distinguishing characteristic such as a label or a tab. Insert this disk in Drive A of your disk drive (the left-side drive slot) with the tab or label up. Push gently until the disk is totally inserted; you will hear a soft click. Remember to handle your disks carefully.

■ **Step 2.** Turn on the computer. The switch is located on the right underside of the keyboard. There will be a slight humming noise, and the small red light under the left disk will flash on and off. When the computer is ready to operate, your screen will display a message.

Again, this may seem simple, but the simpler the instructions, the faster the user will get over any initial uncertainty.

The technical writer can use the same skills to lead the user through the steps necessary to get a software program into the computer and ready to run. At that point, the user can be assisted with finding and interpreting the manual's instructions.

To get the world's most advanced 50 CPS daisywheel printer, you'll have to pay less.

The TeleVideo 750 letter quality printer is nothing short of revolutionary. In design. And in price.

Because the 750 delivers 50 CPS performance using an incredible 40% fewer parts than any comparable printer. It's not mere coincidence that the 750 sells for up to 40% less as well.

Cost of ownership gets even better with time. Fewer parts equal more reliability: an average of 65,000 pages between failures. And with the works in a drawer, repairs—when necessary—are quick and easy.

Fewer parts also equal a low profile, small footprint, and light weight. The 750 printer is plug compatible with virtually any personal computer, mini, or word processing system. And TeleVideo provides a complete selection of supplies and paper handling accessories.

You won't find a printer better suited than the 750 to an office environment. So if you're responsible for printer purchase decisions, the TeleVideo 750 should make your job significantly easier. No longer must you face the hard choice between performance and cost.

For information about TeleVideo Printer dealers in your area or a free demonstration, call 800-821-5992. In California, 408-745-7760.



**Cut S/38 Coding Time
35%.**

RPG LITE makes RPGIII a free format language to speed your coding time.

- 5 minutes to learn 8 easy rules.
- Code multiple statements on one SEU line.
- Type 100 lines of code without hitting enter once.
- Also works with any PC word processing system.
- Just \$795/CPU.

Send for your free demo diskette and judge for yourself. Call Toll Free:

1-800-328-1000, Ext. 125

HELP/38
SYSTEM

15102 Minnesota Industrial Road
Minnetonka, MN 55345 USA 612/935-3311
Division of Advance Circuits

COMPUTER INDUSTRY

Seagate gears to ride out shaky mart



COMPANY PROFILE

Kathleen Burton
CW West Coast Bureau

SCOTTS VALLEY, Calif. — Seagate Technology, Inc., the leader for five years in the booming single-user, hard-disk drive market with a 45% market share, faces an exceedingly difficult year ahead.

Caught in the crosscurrents of an industry reeling from shortened product life cycles, a soft microcomputer market, a trend to overseas manufacturing and the unpredictability of its major customer, IBM, Seagate's future is uncertain.

"The disk industry is in the midst of a shakeout," Seagate founder, Chairman and Chief Executive Officer Alan F. Shugart said in a recent interview. "Within two years, we'll only see six companies left in this business and maybe two leading suppliers."

To survive these troubled times, the company must compete with domestic vendors and the Japanese to gain market share in next-generation products built

around sub-5¼-in. and half-height, high-capacity micro Winchester drives.

"Seagate faces a critical time window," said James Porter, editor of "Disk/Trend Report," an industry newsletter published in Mountain View, Calif. The company must ramp up new products to recoup recent capital expenditures and get those products into the market for systems designers, notably IBM, Porter said. "Seagate should have begun production on half-heights, 20M-bytes and 3¼-in. drives six months ago," he asserted.

Other serious problems lie ahead for the company. Prices, already plummeting 30% annually, are predicted to drop even further, sparked by a cutthroat price war led by Tandon Corp., a new entrant in the hard-disk market, that is expected to undercut Seagate's mass-market 10M-byte product by \$100. Seagate is also plagued by chronic production problems, Porter said, chiefly an inability to get product plans into production rapidly and a tendency to announce products, such as the ST206 half-height, that are never shipped.

Amid those market uncertainties, Seagate in mid-November undertook a major

reorganization, which resulted in the resignations of several key sales and marketing executives. Shugart said the reorganization will provide customers and distributors with quicker access to the company by lessening the levels of in-house bureaucracy. The present reorganization followed an earlier management shake-up in July, which resulted in the abrupt departure of company cofounder and ex-vice-chairman Finis T. Conner. Shugart has become more involved in the company's day-to-day sales and marketing operations since then.

But industry analysts said Seagate is not without important strengths. The company has maintained excellent long-term relationships with more than 200 OEM customers, including heavyweights such as IBM, Digital Equipment Corp., Hewlett-Packard Co., Honeywell, Inc. and AT&T, and has acquired a reputation as a volume supplier with an annual production capability of two million units. To keep manufacturing costs low, Seagate also has a foreign source for every part except disks, which are purchased in the U.S.

See SEAGATE page 76

■ Datapoint Corp. took further steps to cut costs amid reports that the company has caught the eye of Asher Edelman of Management Assistance, Inc. and Mohawk Data Sciences Corp. /79

■ Advanced Micro Devices, Inc. became the latest semiconductor manufacturer to halt shipments of military destined components pending investigation of testing procedures /81

■ Texas Instruments, Inc. recently announced it is cutting 2,000 positions /84

Robots: Orders up, prices down

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — Shipments of robots from U.S. suppliers to users in 1984 will amount to about \$290 million, a 50% increase over the 1983 level, as unit prices dropped about 20%, according to officials of the Robotic Industries Association (RIA).

"The numbers reflect the fact that American industry now recognizes the need to modernize its manufacturing processes by the use of industrial robots," according to Walter K. Weisel, RIA president and president of Prab Robots, Inc., a manufacturer in Kalamazoo, Mich.

The RIA released its new figures — the first hard statistics ever generated by U.S. robot manufacturers — at a press conference here earlier this month. The U.S.

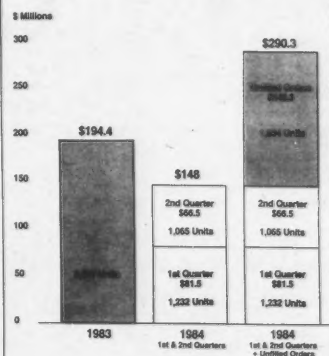
trade association has an all-time high membership of 320 firms, including robot users such as the major automobile manufacturers as well as robot equipment manufacturers and researchers.

Weisel and Donald Vincent, RIA executive vice-president, said the new customer base for robots has expanded from automotive industries to encompass the textile, materials and product handling, aerospace, medical, furniture, electronics, construction and defense industries as well. Robots typically improve productivity by 20% to 30%, they said.

The RIA's statistical survey showed that \$148 million worth of robots were shipped in the first half of 1984, with a backlog of unfilled orders amounting to \$142.3 million. Combining the two figures,

See ROBOTS page 88

Shipments by
U.S. Based Robot Suppliers



ROBOTIC INDUSTRIES ASSOCIATION CHART



INDUSTRY INSIGHT

David Olmos
CW Staff

Engineering teachers feared in short supply

As the U.S. computer industry struggles to remain king of the technology hill amid challenges from Japanese, European and other up-and-comers, a continuing dilemma is the education of electrical and computer science engineers. The question is often raised: Will there be enough engineers to meet the needs of the industry, and how well-trained will they be?

The American Electronics Association (AEA) and assorted forecasting groups are predicting

See AEA page 88

IBM, NCR Comten to meet in court

Copyright violation countered with antitrust charges

By Kathleen Burton
CW West Coast Bureau

LOS ANGELES — IBM and NCR Comten, Inc., a division of NCR Corp., will square off this month in a legal battle over the alleged disclosure of proprietary information by a computer consulting firm.

The charges, which will be heard in federal courts here and in Minneapolis, indicate the measures many computer companies, including IBM, will take to protect their computer secrets. The countercharges subsequently brought by St. Paul, Minn.-based NCR Comten against Evergreen Consulting, Inc., a consulting firm based here, also focus on the question of how much material from competing companies consultants may disclose to their clients.

A preliminary injunction hearing today in Los Angeles' 9th Circuit Court will determine whether NCR Comten will be prohibited from using a program it is alleged to have unlawfully copied from

IBM. The dispute began in 1980 when IBM hired Evergreen to evaluate products that competed with IBM's 3705 communications processor, which is a gatekeeper for information entering mainframes.

In carrying out the evaluation, Evergreen discovered that segments of the software used with NCR Comten's communications processor were identical to IBM's Advanced Communications Function/Network Control Program. Evergreen procured a copy of the NCR Comten program and relayed the alleged copyright infringement information to IBM.

In 1981, IBM notified NCR Comten that the program infringed on IBM's copyright and demanded a \$74,000 payback for the alleged misuse. NCR refused, and the legal sparring began in November 1982, when NCR Comten brought suit in a federal court here against Evergreen, charging that the company had disclosed proprietary information

See COURT page 84

COMPUTER INDUSTRY



ALAN F.
SHUGART

Alan F. Shugart, founder, chairman and chief executive officer of Seagate Technology, Inc., has nearly 30 years of experience designing computer peripherals and systems; he spent 18 years with IBM as a field engineer, was subsequently vice-president of product development at Memorex Corp. four years and, in 1973, founded Shugart Associates, a floppy disk drive company that Xerox Corp. later purchased. In a recent interview with Computerworld West Coast correspondent Kathleen Burton at Seagate's Scotts Valley, Calif., headquarters, Shugart discussed IBM, Seagate's biggest customer, and talked about the emerging markets that will drive the volatile rigid-media market in 1985.

Q What's going to happen in the rigid disk market over the next two quarters?

The disk industry is in the midst of a shakeout. Within two years, we'll only see six companies left in this business and maybe two leading suppliers.

The other companies will go broke, get acquired or enter small, niche markets with low volumes. I don't see any improvement over the next two quarters either, because the same conditions will exist in the marketplace.

Q What's driving this shakeout?

There's been a slowdown in user acceptance of desktop computers. This industry goes where the small-computer industry goes. I predict a resurgence in the small-computer systems market, however, driven by more computing power and lower costs. Seagate's low cost structure for large rotating memory devices will help fuel this revitalization.

Q How are Seagate's fortunes tied to IBM's?

IBM is our largest customer, representing almost 60% of our business.

Obviously, we have a very good relationship with IBM.

Q Is this a frightening position for Seagate — to be this dependent on IBM?

Absolutely, but the alternative is more frightening. The minute you're not scared in this business, you're doomed.

Q What do you think of IBM's ability to set standards in the industry? Is this good?

If it weren't for IBM, we wouldn't have any standards, not even an 80-column card.

It's not the standard itself that's important, but the fact that IBM can dictate that a standard exists. I think that's a great thing. The industry is incapable of doing it itself.

Q What specific problems lie ahead in 1985?

A price war will be sparked by the industry-wide move to [foreign] manufacturing and the entrance of Japan into the 3½-in. market. This will drive a lot of marginal suppliers out of business.

Q Are you worried about this Japanese competition?

No. Floppy disk technology is now 11 years old, and the Japanese have won 80% of that market. This is because the technology leveled off, and the Japanese did what they do best — automate production.

The technology curve for rigid drives is still too steep for this to happen here though, and product life cycles are still too short. The Japanese can't beat us at competitive cost structures either, because they build [overseas] just like we do.

Another subtle deterrent to the Japanese is the complicated nature of the disk drive interface. It's a harder interface to duplicate than those on watches, cameras or printers.

The Japanese also face two major problems in selling products to U.S. systems manufacturers: the high levels of technical support required and Japan's historic inability to perceive why its "perfect products" don't always work in a customer's system.

Q What technical problems will Seagate address in the future?

We'd like to participate in two emerging markets. As capacities increase, the hard-disk backup issue becomes more critical.

Most MIS directors at Fortune 1,000 companies are very worried about backing up their personal computers. The best solution now is [with streaming tape drives], which isn't very cost-effective.

Also, as products with a gigabyte of networked storage become common, it's impossible to archive using floppy disks. Maybe optical storage is the solution.

Vendors view IBM contracts as precarious blessings



COMPANY PROFILE

Kathleen Burton
CW West Coast Bureau

Industry observers say the sharp dip in Seagate Technology, Inc.'s sales is due to a slowdown in orders from IBM, which, as Seagate's largest and most influential customer, accounts for 59% of the company's sales.

"This is an OEM business, and all disk companies will rise and fall with their customers' whims, notably IBM's whims," said Dave Claridge, senior analyst at investment banking firm Hambrecht & Quist in San Francisco.

"IBM did a sloppy job of planning its future requirements and is whipsawing its vendors — including Seagate — all over the place now," said James Porter, publisher of "Disk/Trend Report," an industry newsletter published in Mountain View, Calif.

According to Porter, IBM plans to ramp up to produce internally 100% of the 3½-in. and high-capacity 5¼-

in. products destined for the Personal Computer AT.

IBM is also shopping among domestic vendors for 10M-byte and half-height 20M-byte products for the Personal Computer XT, according to Porter.

Negotiations are also under way between IBM and two Japanese vendors, Alps and Toshiba Ltd., for 3½-in. floppy disk products reportedly scheduled for IBM's portable computer, Porter added.

Winchester contracts follow

"You can bet that where floppy contracts go, Winchester contracts will follow a year later," Porter said.

"Having IBM as a major customer is a mixed blessing," said Bill Frank, a senior analyst at Infocorp, a market research firm in Cupertino, Calif.

Companies that frenetically ramp up for IBM's 18-month contracts and neglect their other customers have no guarantee that IBM will stay around when the contract expires, he said, adding, "dealing with IBM is very precarious."

Seagate to tap Asian mart

Manufacturing strategies fuel sales drive

Vertical integration and automated offshore manufacturing are two trends sweeping the hard-disk industry.

Both are necessary steps to meet the aggressive pricing environment predicted for next-generation products, said Tom Finnegan, Seagate Technology Inc.'s director of international sales.

"Our intention is that all volume production will eventually be done offshore," Finnegan said, "but we're taking it one step at a time."

Untapped markets

Bob Toda, Seagate's director of Far East Marketing, said the company plans to push into the virtually untapped Japanese and Far Eastern markets during 1985.

To ramp up for this move, Seagate recently expanded its 41,000 sq-ft offshore operation in Singapore, which supplies printed-circuit boards, head assemblies and drives for shipment to Europe and the Far East.

This gives the company a foreign source for every part used in its products except disks, which are still manufactured in the U.S. Toda said Seagate also hopes the offshore dis-

tribution network will woo major U.S. customers that have recently moved production operations overseas.

Company Chairman Alan F. Shugart explained the company's interest in the Japanese market: "With the word processing and data base business applications developing rapidly in Japan and the massive storage requirements of the Kanji language, the Japanese will be major purchasers of 20M-byte-plus products. They'll skip the 10M-byte market completely. Japan has the second largest market potential for rigid media after the U.S., and we plan to be there."

Seagate began its marketing and selling thrust in Asia two months ago, Finnegan said, by establishing procurement offices in Tokyo and Taipei, signing distribution agreements in Korea, China, Hong Kong, Singapore and Malaysia and negotiating with Japanese suppliers.

Seagate also began to accelerate its vertical integration strategy last year, he said, acquiring Grenex, a California company that develops sputtered thin-film magnetic media, an eventual means to increase disk storage.

Q: How Many People
Are Afraid Of Your
4-GL/DBMS?

A: None, If You Have
EZNOMAD.

That's right. EZNOMAD is a major extension of NOMAD2 that pulls novice and infrequent end-users into the mainstream of mainframe computing. EZNOMAD's screen-driven environment requires no key words, system commands, or knowledge of syntax for operation.

With EZNOMAD, your end-users can sit back and follow a series of English-language instructions, menus, and pick-and-point screens. Now, those busy "management types" who "never have the time" to learn mainframe computing don't need to take the time. Infrequent users no longer need to "relearn" the system every couple of months.

EZNOMAD's micro-like capabilities access essentially all of the functions and power of NOMAD2. Imagine a senior manager in your company developing databases, creating applications, maintaining databases, and writing ad hoc reports — without your help.

Your senior management will not only be pleased with the capabilities of EZNOMAD, they will also be delighted with the cost of EZNOMAD—its's free to all NOMAD2 licensees.

In other words, you get the ease-of-use of a micro and the tremendous power and flexibility only a mainframe can deliver. And the price is right.

It's nice to know that when you pick NOMAD2 as the 4-GL/DBMS for your company, EVERYBODY will know first-hand that you've made the right choice.

EZNOMAD is the latest innovation in end-user computing from Dun & Bradstreet. NOMAD, now NOMAD2, has evolved over the years to keep pace with the demands for providing business professionals with maximum computing power. EZNOMAD is a major stride in that direction.

NOMAD2:
An Innovation In
End-User Computing
From Dun & Bradstreet

**D&B Computing
Services**

DB a company of
The Dun & Bradstreet Corporation

For more information call: Roger Cox at (203) 762-2511. Or drop your business card into an envelope and mail it to Roger at: D&B Computing Services, 187 Danbury Road, Wilton, CT 06897.

NOMAD is a registered trademark of D&B Computing Services, Inc.

VSI-RESOURCE for VM/CMS

VSI-MULTITERM for VM/CMS

VSI-RESOURCE for VM/CMS

VSI-MULTI

THE MAN HAS GONE CRACKERS!

Last month the boss got a little crazy. He put our \$2,500.00 MULTI-TERM product on the market for \$500.00. This time he has definitely gone over the edge. He says for 30 days our VM PERFORMANCE MONITOR/CAPACITY PLANNING system (VSI-RESOURCE) goes for \$2,000.00 plus \$300.00 annual maintenance.

So if you want real time performance monitoring, to see vmlocks without system dumps, graphics instead of numbers, ability to do online capacity planning... VSI-RESOURCE is the answer when you need it, NOW!!

You have 30 days to order. Do you have any idea the amount of commission I'll lose at this price? As sales manager I think it's just too much. When you order, please include 2 aspirin in the envelope. No aspirin! No deal! Sales managers can get crazy too.

**Vision
Software
inc. Incorporated**

Sincerely,
Barbara Christensen
Sales Manager
(916) 325-4726

6120 Wycliffe Way, Sacramento, CA 95831

VSI-RESOURCE When you need information Now!

VSI-MULTITERM for VM/CMS

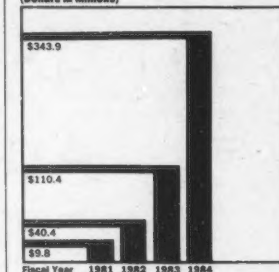
VSI-RESOURCE for VM/CMS

VSI-MULTITERM for VM/CMS

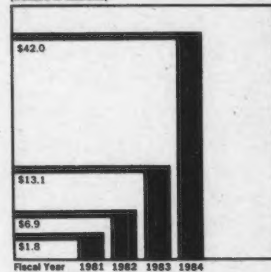
VSI-RESOURCE

COMPUTER INDUSTRY

NET SALES
(Dollars in millions)



NET INCOME
(Dollars in millions)



Seagate Technology, Inc.'s financial performance

SEAGATE from page 73

Industry watchers also said the rigid media industry is basically

healthy and will rebound, based on the market's acceptance of integrated software, AT&T Unix-based applications (requiring higher capacity products) and a revitalized personal computer workstation sector.

However, Seagate must contend with a hard-disk market that is branching in two different directions, according to David Claridge, a senior analyst at the venture capital investment firm of Hambrecht & Quist. The direction is toward smaller, lower cost drives for the transportable and single-user market and to full-size, higher performance drives destined for multiuser systems, he said.

Seagate is addressing both markets with recently announced products, claimed Doug Mahon, Seagate's senior vice-president and chief technical officer. Presently in the works are a drive for the IBM Personal Computer AT, a family of 3½-in. products (perhaps destined for IBM's portable computer), several intelligent disk drives that allow the drive's controller to communicate with the CPU and a high-capacity line of 5¼-in. voice coil products.

Rags-to-riches story

Seagate's corporate history is a classic Silicon Valley rags-to-riches story. In 1979, Connor approached Shugart, then president of a floppy disk drive company he had founded called Shugart Associates, predicting an exponentially growing market would emerge for hard disk drives among microcomputer users. Shugart, Connor, Mahon and Thomas Mitchell founded Seagate in November of that year and, in 1980, shipped \$10 million worth of 5¼-in. rigid disk drives, offering six times as much storage and access times 1½ times faster than floppy disks.

The market took off and, by 1982, 8% of the microcomputers sold were equipped with hard disks. In 1983, the steep growth curve continued — Seagate shipped 200,000 drives and posted revenues of \$110 million.

But by the second half of 1984, the boom ended. Seagate's sales plunged from \$100 million to \$50 million. The company remained profitable, however, raising cash-on-hand from \$13.7 million to \$29.7 million and boosting equity to \$165 million.

To ride out the slowdown, Seagate is carefully guarding its resources. In October, recently appointed Seagate President and Chief Operating Officer David Mitchell said the company, which laid off 700 employees last July, has frozen hiring and will sell a never-used manufacturing facility in Watsonville, Calif.

"We definitely [have] no cash flow problems," he said, alluding to a \$40 million multibank line of credit.

AVAILABLE NOW FROM

MICRO-TERM

ERGO 301 FK with FUNCTION KEYS



Guaranteed VT 100-
Compatible **PLUS**

only **\$795**

ERGO 301 is still available
for just \$745 list.

Quantity Discounts Available

- STANDARD FEATURES:**
- Advanced Video Graphics
 - Integrated Printer Port
 - Two Pages of Memory
 - 256K Random Access Memory
 - 25 Functions: Key Board Definitions or User Programmability
 - Graph Screen with Super Screen
 - Superior 512 Column Display
 - Full one-year warranty

- OPTIONAL:**
- 1024 Column Display
 - 1024 Column Display
 - 1024 Column Display
 - 1024 Column Display

What you need TODAY, TODAY
COMPATIBILITY, tomorrow's features
Your MICRO-TERM

Terminal version only. A full line of software is available. Contact your local Micro-Term dealer for more information. Micro-Term, Inc., 11100 E. 1st Ave., Suite 100, Denver, CO 80231. (303) 751-1111. Telex: 150700. Cable: MICRO-TERM. FAX: (303) 751-1112. Service available at retail and wholesale through authorized dealers.

DunsPlus: The Micro Solution That Reflects The Way You Do Business

You've heard the buzzwords: user friendly, integrated, smarter, faster, cheaper. But when you push the rhetoric aside you're still asking the same question, "Why can't I get a system that solves more problems than it creates?"

You can. It's called DunsPlus and it's built to respond to your information-related business demands without creating demands of its own.

DunsPlus gives the IBM PC XT a built-in business environment. This lets you mold DunsPlus to fit the way you do business.

Within the DunsPlus environment is a software base of the best. Lotus, MultiMate, Western Union electronic mail (to name but a few), are all ready for immediate use. But additional programs to solve your unique problems can also be added with ease.

Instant, yet controlled, access to your choice of mainframes and subscription databases is also a part of the DunsPlus environment. And transferring data throughout the system is as easy as moving a piece of paper from the In Box to the Out Box.

Immediate end-user productivity is not an issue: DunsPlus is a menu-driven system requiring minimal keystrokes for maximum results.

Installation is not an issue: DunsPlus is installed by IBM.

End-user training is not an issue: Training and support are part and parcel of DunsPlus.

Flexibility is not an issue: Any part of the DunsPlus solution--hardware, software, or service--can be tailored to meet your precise business needs.

In fact, there are no issues. DunsPlus does what you want, the way you want it--now.

Designing systems that reflect the way you do business is business as usual for us. NOMAD2, the premier 4th-Generation-Language/DBMS from D&B Computing Services, has made us a leader in the field of information management services. And as your needs evolve, so do we. DunsPlus is just the latest step in translating technological advances into usable business tools--tools that reflect the way you do business.

**DunsPlus:
An Innovation In
End-User Computing
From Dun & Bradstreet**

DunsPlus

DB a company of
The Dun & Bradstreet Corporation

For further information call: 800-DNB-PLUS. Or drop your business card into an envelope and mail it to DunsPlus, 187 Danbury Road, Wilton, CT 06897.

Lotus spreadsheet and graphics from Lotus Development Corporation. MultiMate™ word processing from MultiMate International, Inc. IBM is a registered trademark of International Business Machines Corporation. DunsPlus is a trademark of DunsPlus, a company of The Dun & Bradstreet Corporation. NOMAD2 is a trademark of D&B Computing Services, Inc.

COMPUTER INDUSTRY

New high-tech firms boast third-quarter growth in



OUTSIDE LINES
Bohdan Szuprowicz

Bankruptcies, layoffs and liquidations have intensified among high-technology firms in recent months, but at the same time more new firms than ever before showed a spectacular growth performance in earnings and revenues.

Storage Technology Corp. became the largest computer company ever to file for Chapter 11 of the Federal Bankruptcy Act, yet at least 30 rapidly growing, publicly owned firms have seen their revenues increasing by at least 100% during the third quarter of 1984, compared with the same period in 1983.

Twenty-two of those firms — over a third more than a year ago — also registered simultaneous increases in earnings per share (EPS) of more than 100%, which sets a record since 1983 when we began keeping track of such superperformance.

Absence of micro software

What is significant about those top performers this quarter, however, is the virtual absence of microcomputer software or even minicomputer disk drive manufacturers that often dominated this list in previous quarters. This time, the fast-growing firms are primarily in semiconductor-related and telecommunications-based industry segments, with just a spattering of firms from among peripherals and memory-media suppliers.

Micron Technology, a small start-up that took on the Japanese in cutthroat competition for a share of the 64K-byte random-access memory semiconductor market, made it to the top of our list this quarter with a spectacular performance, increasing its EPS by 2,900% and continuing similar growth levels during the second quarter of 1984, which earned the firm second place on our list three months ago.

The company went public in June 1984 at \$14 per share and rose as high as \$40 per share in the aftermarket, making it one of the year's best-performing initial public offerings.

Lam Research Corp., which also made our list for two quarters running, is perhaps not widely known, but the company represents a new crop of manufacturers in the critical plasma-etch equipment industry, which is vital for expanding very large-scale integration (VLSI) microchip production. The company is at the cutting edge of the VLSI revolu-

tion, which is now gathering momentum and will drastically change the semiconductor industry.

Advanced Micro Devices, Inc. and SEEQ Technology, Inc. are two other semiconductor manufacturers on our list, and Mentor Graphics Corp., Valid Logic Systems, Inc. and Daisy Systems Corp. are the big three suppliers of

computer-aided engineering (CAE) workstations and design systems that are making custom and semicustom VLSI products an economic reality.

Among the top-performing firms in the general area of telecommunications, 3Com Corp. and Ungermann-Bass, Inc. are the first two public local-area network manufac-

turers whose appearance on this list underscores the rapid growth of local-area network markets that has been under way for the last two years. Optronics and Fibronics International, Inc., on the other hand, represent an even faster growing segment of electro-optical systems and components — many of which end up in fiber-optic

local-area networks, robotic systems, artificial vision and factory automation, where specialized industrial local-area networks are among the fastest growing of all high-technology markets today.

VMX, which markets voice mailboxes used as electronic answering services, began shipping its systems to large corporate cli-

BEHIND EVERY SUC IS AN M.I.S. DIREC



COMPUTER INDUSTRY

revenues, earnings in period of increased casualties

ents and major telecommunications equipment and service suppliers. It was the first of the voice store-and-forward equipment and services suppliers to go public last year and appears to be growing rapidly in a new market segment. Equatorial Communications Co., which makes small earth stations for low-cost satellite commu-

nications networks, became an instant hit with institutions when it went public a year ago; now almost 50% of its stock is in institutional portfolios. COM Systems is a manufacturer of computerized telephones; Digital Communications Associates, Inc. is a leading independent supplier of large data communications networks; and Walk-

er Telecommunications provides marketing, engineering and other services to the industry.

Of the remaining top performers, Apollo Computer, Inc. needs no introduction. It has already earned itself a place as one of the biggest successes ever since going public in early 1983. Apollo is now clearly

among the new leaders in 32-bit supermicrocomputer or workstations product categories and its future remains very bright, provided it moves fast enough to keep ahead of the VLSI-driven competition.

Quality Micro Systems, Inc., among the original independent laser printer suppliers in the U.S., has made our

list because the nonimpact printer segment of the market is soaring, particularly with the strong growth in the laser printer niche.

Computer Memories, Inc.; Xidex Magnetics, a subsidiary of Xidex Corp.; and Wyse Technology, Inc. round off the list of top performers.

Szaprowicz is president of 21st Century Research of North Bergen, N.J., and publisher of Supergrowth Technology USA.

CESSFUL BUSINESSMAN TOR WITH CLOUT.

"I JUST GOT THE BEST PRESENT A MANAGER COULD GET."

In most companies, there's one thing managers want even more than corporate perks or bigger staffs.

Information.

And they'll drive your whole DP staff up the wall trying to get it. They'll ask you to round up data that's scattered all through the company. Then expect you to sort it a hundred ways from Sunday. And deliver it last week.

Even worse, they'll buy carloads of PCs, then come running to you for help every time they forget how to plug one of them in.

But now, there's a way to give these global marketing heavies the answers they've been looking for. And give yourself a break at the same time.

All you do is take the mainframe data they want—and download it into their PCs, hard disks, or network servers. Then give every one of them a new software program called Clout. It's as simple as that.

**"IT WRAPS UP
FILES FROM LOTUS 1-2-3,"
PFS:FILE," DBASE II,"
THE MAINFRAMES,
AND MORE."**

In the past, it used to be near impossible to pull information together from different sources,

without re-entering every bit of the data. But the new Clout takes data files directly from these popular programs—plus ASCII, DIF, and SYLK files, too. So users can get information from other PCs by sharing floppy disks. Or being part of a LAN. Clout can even read files that have been transmitted from the company mainframe. Or another PC.

Anytime users have a question, they just ask—in their own words! Clout will scan up to 40 of these files automatically, cross-reference five simultaneously, and there's the answer. They don't have to know exactly how the data is organized. Or even in which file it's stored. Best of all, Clout won't let these high-powered managers pollute the database. No matter how hard they try.

**"NOW THE WHOLE
DP DEPARTMENT
CAN GET
A CHRISTMAS BREAK."**

Clout's self-guided, step-by-step tutorial makes learning so easy, your staff will spend less time training these people. And more time on the things they do best. Like figuring out



ways to improve operations. And maybe, vacationing in the Bahamas this winter.

**"GIVE YOURSELF
A BONUS.
GET A DEMO TODAY."**

Clout's suggested retail price is less than \$300—a small price to pay for a big boost in productivity. But if you prefer we'll send you a full demo of Clout for only \$6.95 (plus shipping). Just call 1-800-547-4000, Dept. 927. In Oregon, or outside the U.S., call 1-503-684-3000, Dept. 927. Or get in touch with your nearest computer or software store.

And see what it's like to wield a little Clout.



**CLOUT™
FROM MICRORIM®**

Requires 256K of memory. Runs on MS-DOS and PC-DOS operating systems. Hard disk recommended.

Datapoint consolidates to cut costs

SAN ANTONIO — Datapoint Corp. recently announced further moves to consolidate its operations, and it was further reported that the company's management faces intervention from an investor who was responsible for altering strategies substantially at two other computer vendors earlier this year.

The company, which experienced a 73% decline in profits to \$1.5 million for the quarter ended Oct. 27, said it would combine the manufacturing activity from its Fort Worth, Texas, plant with its plant here and would close the Fort Worth plant effective Jan. 31.

A spokesman for the company also said it was lengthening by several days the traditional holiday season production shutdown.

The Fort Worth closing will enable the company to reduce overhead costs of manufacturing operations and to bring production and inventories in line with demand, according to a spokesman.

The holiday shutdown extension, from Dec. 17 to Jan. 4, lengthened from the normal shutdown of Dec. 21 through Jan. 2, will permit the company to balance the output of its work force with product demand pending the Fort Worth closing, the spokesman said.

Meanwhile, *The Wall Street Journal* reported last week that investor Asher B. Edelman was expected to file with the Securities and Exchange Commission notification that he holds shares and options totaling nearly 10% of Datapoint's stock.

The newspaper reported that anonymous sources said Edelman will attempt to influence management or take control of the company.

COMPUTER INDUSTRY

IBM to face marketing, productivity challenges by

By John Desmond
CW Staff

TARPON SPRINGS, Fla. — Because IBM's manufacturing costs, as a percentage of revenue over a 13-year period from 1976 to 1989, will rise by 9%, selling expenses must be shaved by an equivalent amount to meet profit targets.

This scenario was outlined by Gartner Group, Inc. vice-president Stephen P. Cohen at a conference for IBM large-systems users here recently.

According to the Connecticut-based market research and consulting firm, costs increased from 36% of revenue in 1976 to an estimated 41% in 1984 and a projected 45% in 1989.

Will not cut R&D

IBM will not cut research and development budgets, since it must compete with such potential threats as the Japanese firms and AT&T.

Cuts will be made from selling and general administration expenses, a marketing and productivity challenge for IBM, said Cohen, Gartner's director of Industry Service and a former IBM strategic planner.

Gartner Group estimated that IBM plans to cut selling expenses from 18% of income this year to 15% in 1989 and to cut general administrative expenses from 9% to 7% in 1989, Cohen said. Expense as a percentage of revenue is targeted for a reduction from an estimated 35% this year to 30% in 1989, he added.

Staffing expenses to rise

The expense burden of the marketing staff, estimated to be \$110,000 per person this year, is projected by the Gartner Group to rise to \$140,000 per person in 1989 if the expense is held to the rate of inflation.

The estimated revenue generated per member of the marketing staff, \$613,000 this year, would have to rise to \$929,000 to meet IBM objectives, Cohen said. That rise would be equivalent to a 52% improvement in five years. "That's the challenge IBM is facing," Cohen said.

This challenge assumes that IBM will keep pace with a projected 18% annual industry revenue growth and can hold its sales expenses per man-year to inflation. If IBM fails in either objective, its sales force would have to generate even greater than 52% improvement, Cohen said.

"Either IBM's profitability will suffer and [it] will not achieve [its] objective, or IBM will not be able to price [itself] as competitively as [it] would like and [it] will not be able to achieve the market share [it] would like," Cohen said.

"All strategies IBM has embarked on in the area of selling, administration, service and manufacturing are oriented around achieving that productivity," he added.

Methods for strategies

Among methods to achieve the strategies, Cohen said, IBM will employ the following:

- It will use its direct sales force only for big-ticket customers, promote long-term commitment through account plans (suggested long-range growth paths), presell products with more statements of direction and automate elements of the sales cycle.

- It will use alternate marketing channels for

smaller customers, trying to lower the cost of selling. "If you can't eliminate selling expense entirely, the next best thing is to do that selling with a lower paid person," Cohen said.

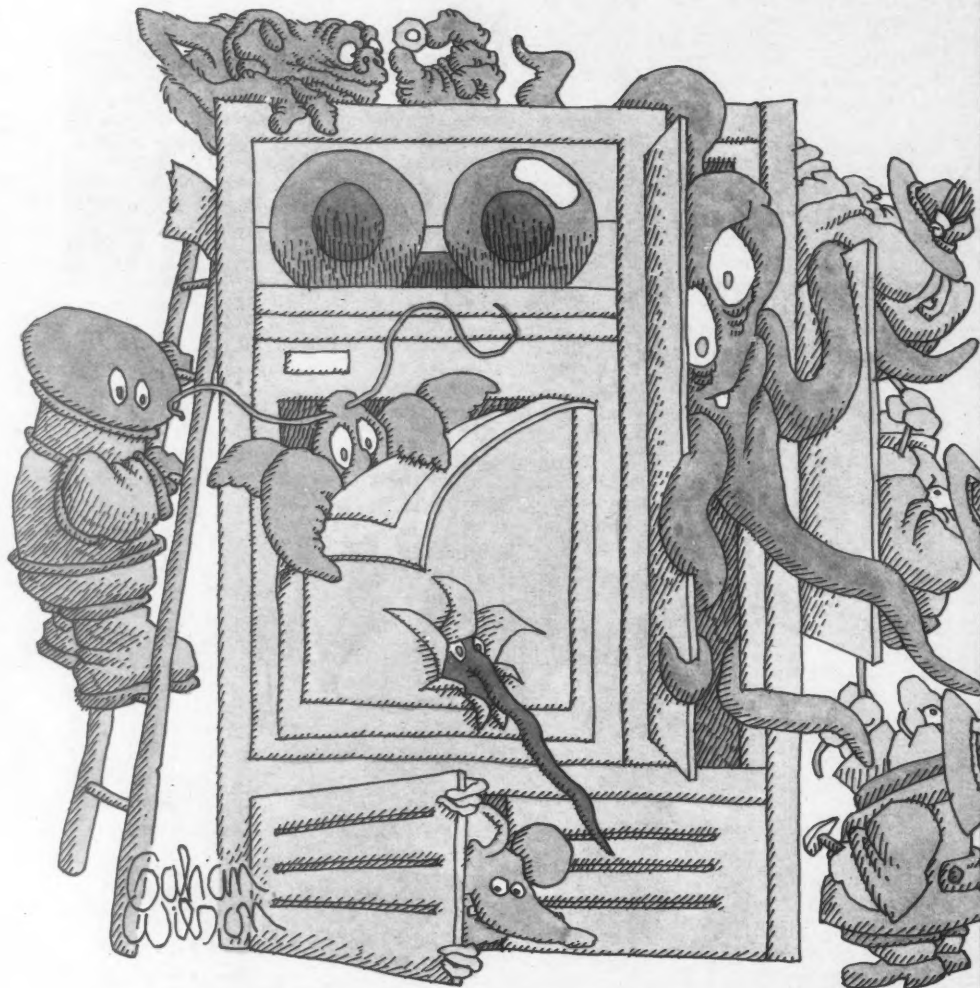
- It will design products to minimize selling expense, with features including ease of use for end-user products and standard user interfaces

to lower training and support expenses.

- It will design products for improved reliability, availability and serviceability. Improved diagnostics and field-replaceable units will aid this goal, Cohen said.

Another way for IBM to reduce service expenses would be to absorb unneeded field engineers elsewhere in

IT'S 3 A.M. DO ACCESSING YOUR



PROTOCOL.THE END OF THE

COMPUTER INDUSTRY

trimming budget, 9% rise in expenses

the company, Cohen said. But, he added, IBM will go slowly in moving its field engineers out of fear the engineers might form a union.

In manufacturing strategy, IBM will turn to the OEM market more in order to spread costs over a bigger base, Cohen said, pointing to the recent agreement between IBM and Honeywell,

Inc. to market older IBM mainframes as one example.

'IBM will get more aggressive'

The Gartner Group projected that IBM's long-term revenue growth rate will be 16% annually; thus, IBM will lose market share if industry revenue grows at an 18% annual rate. Meanwhile, the market share of the Japanese

is increasing, Cohen said. As a result, "IBM will get more aggressive," he said.

The aggressiveness could result in products with little competition being priced higher, software prices increasing rapidly and software fees being based on usage rates, he suggested. IBM now has decision support software with a price based

on the number of signed-on terminals users, he noted.

IBM will use financial muscle to block competition and penetrate new markets, he said. When competition emerges, IBM will drop prices to try to thwart it, he said, noting the experiences of Storage Technology Corp. and Control Data Corp. in the disk drive business.

AMD halts DOD chip shipments

By David Olmos
CW Staff

SUNNYVALE, Calif. — Advanced Micro Devices, Inc. (AMD) recently suspended the shipment of certain integrated circuits to U.S. Department of Defense contractors after an internal audit discovered discrepancies between the company's testing procedures and those of its contractors.

Advanced Micro, a semiconductor manufacturer, said shipments will not resume until the company can determine that its testing procedures are meeting customer specifications. Deliveries of the chips were halted Dec. 1.

"The inconsistencies were discovered as part of a special audit of all customer special test specifications following discovery of similar situations at several other manufacturers of integrated circuits," said Jim Lynch, vice-president of quality assurance and reliability.

The Advanced Micro action is the latest in a series of testing irregularities at major manufacturers of military chips. Earlier this year, Texas Instruments, Inc. and Signetics Corp. reported testing problems, and Schlumberger Ltd.'s Fairchild division has notified the Department of Defense that some of the chips it supplied to contractors may have been improperly tested.

A spokesman for Advanced Micro said the company has not been informed of any disciplinary action by the Defense Logistics Agency, the Department of Defense's procurement unit.

The spokesman said the chip testing question "has brought about a complete review of everything. All these occurrences have prompted everyone to look a lot closer" at test procedures, he said.

Last March, National Semiconductor Corp. pleaded guilty to federal charges that it falsified test data for chips supplied to the military.

Advanced Micro said shipments of joint Army-Navy products and standard catalog products were not included in the suspension. The company said after its Dec. 4 announcement that it expects to complete a review of its testing procedures within 120 days. "We think we can do it by then," a company spokesman said.

A company spokesman said it will immediately resume shipments to customers where no inconsistencies are found.

YOU KNOW WHO'S MAINFRAME?

This real life nightmare can make any DP manager lose sleep.

You want to give more people access to your corporate mainframe, so they can get the information they need.

Which is nice.

Except that when you start adding terminals in different locations, how you do control access?

How do you restrict who can upload—and who can download? How do you keep hackers, intruders and other undesirables from invading your mainframe?

DATA COMMUNICATIONS PRODUCTS FROM PROTOCOL COMPUTERS. TECHNOLOGY THAT HELPS DP MANAGERS STAY IN CONTROL.

Rest easy.

PCI can show you how to connect virtually any ASCII device to an IBM mainframe. And control mainframe access with positive security.

For example, our PCI protocol converter boxes and PCI-Link add-on communications board both require users to identify themselves with a special password before they can access your host.

That gives you an extra measure of protection.

What's more, PCI protocol converter boxes also offer automatic log-off. So even if your user forgets, your PCI protocol converter will automatically disconnect from the mainframe. Which means unauthorized inquiries are automatically locked out.

FOR MICRO TO MAINFRAME COMMUNICATIONS, NO ONE TALKS TO IBM LIKE PROTOCOL.

There's another reason you know you're secure



Only Protocol Computers offers both protocol converter boxes and add-on communications boards with positive security features to help you control who gets access to your mainframe. And who doesn't.

with PCI. We're the leader in protocol conversion technology.

In 1980, we introduced the first successful protocol converter. And today, more than 9000 PCI boxes are installed worldwide, handling data communications for leading companies in diverse industries. Including aerospace. Oil. Packaged goods. Manufacturing. Banking. And retail.

The fact is, PCI connects more ASCII devices to more IBM mainframes than any other protocol converter manufacturer.

And PCI is the only single source that offers a complete range of data communications products.

Advanced protocol converter boxes. Communications boards. And powerful support software.

So we can show you how to connect virtually any ASCII device to an IBM mainframe—in Bisynd and SNA/SDLC.

With greater performance.

Less cost. And the positive security you need.

For complete technical information on the full range of PCI data communications products, call 1 (800) 423-5904. In California, 1 (818) 716-5500. Or just send the coupon.

Your DP nightmares are over.



I want to wake up from the DP nightmare. Please send me my free "The End of the DP Nightmare" kit today.

Protocol Computers, Inc.
6150 Canoga Avenue
Woodland Hills, CA 91367

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone _____



© Copyright 1984 Protocol Computers, Inc.
IBM is a registered trademark of International Business Machines Corporation.

DP NIGHTMARE.

CW12/17/84

SAVE!**ON 3-D
MAINFRAME
SPREADSHEET**

was \$16,500 and \$13,200
OS/MVS · TSO CICS \$7,500
DOS/CICS \$5,000

Sale ends December 31, 1984

15 DAY NO OBLIGATION TRIAL

**UNICALC
CORPORATION**

(215) 667-3485
Two Academy Lane
Wayne, PA 19087

COMPUTER INDUSTRY**Tandon files patent complaint**

By David Olmos
CW Staff

CHATSWORTH, Calif. — Tandon Corp. has filed a complaint with the U.S. International Trade Commission charging three Japanese companies and their American subsidiaries with infringement of a patent covering floppy disk drive technology.

In its action, Tandon, a disk drive manufacturer based here, is seeking an investigation into the alleged infringements and an order barring future imports of the Japanese disk drives involved in the complaint.

The complaint names Mitsubishi Electronics Corp. and its U.S. subsidiary, Mitsubishi Electronics America, Inc.;

Teac Corp. and its U.S. subsidiary, Teac Corp. of America; and Sony Corp. and its U.S. subsidiary, Sony Corp. of America.

'Imminent demise' of industry

Tandon's complaint, filed Dec. 6, warned of the "imminent demise" of the U.S. floppy disk drive industry as a result of the alleged Japanese infringements. U.S. disk drive manufacturers have been hurt by competition from Japanese imports. The suit cites the estimate of industry analyst James N. Porter, editor of the "Disk/Trend Report" newsletter, that the Japanese will be the world leader in floppy disk sales by 1985.

In a related action, Tandon filed a patent infringement suit in U.S. District Court in Los Angeles against the same Japanese parent firms and subsidiaries. The suit seeks to bar further sales of the Japanese disk drives. It also seeks unspecified damages and asks that the damages be trebled as a result of the alleged "willful, deliberate and intentional" patent infringement.

Spokesmen for the Teac subsidiary in Montebello, Calif., the Mitsubishi subsidiary in Torrance, Calif., and the Sony subsidiary in Compton, Calif., said they have not yet received copies of the complaint and would not comment until they do so.

Complaint's allegations

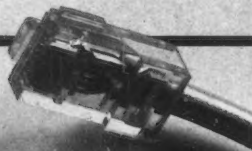
The complaint alleges that Mitsubishi and Teac have imported double-sided floppy disk drives through their American subsidiaries that infringe upon patents held by Tandon. It further charges that Sony, through its subsidiary, has imported 3½-in. double-sided floppy disks that constitute an infringement of Tandon patents.

The Tandon complaint claims that the patent is "one of the most valuable in the floppy field," having enabled Tandon to manufacture double-sided floppy disks that could be mass-produced at a low cost. Tandon further claimed that the invention "has been a major factor in sustaining the explosive growth of the microcomputer industry."

Tandon said it has granted licenses for the patent to several U.S. manufacturers, including IBM; Hewlett-Packard Co.; Shugart Associates, Inc.; Magnetic Peripherals, Inc.; and Micro Peripherals, Inc. The suit claimed that, because of Japanese competition, Micro Peripherals has since gone out of business, and Shugart decided to close a large portion of its California disk drive facility in October.

Attention IBM Users

**"Paradyne
Makes Your
Remote Devices
Behave...
Like Locals."**

**Plug Them Into
Paradyne's PIXNET**

With PIXNET, terminals and high-speed peripherals can be placed in any location. In another building or another town.

They'll be gone but not forgotten. Because they'll still behave like local devices, under the control of your same CPU over your same communication lines.

The "Spooler Fooler"

With Paradyne's PIXNET, remote = local. The host CPU will think your remotes are right in the same room. So remote devices can be run from their own locations.

Access any program or application, in any computer on the network, from the remote location.

Low-Cost Network Expansion.

Widen your data operation with this cost-effective networking innovation.

Move a device, a CPU, or a department over the weekend and be up and running Monday morning.

With no extra front-end processors. No extra software, for host or application. No extra burden on the host.

Improved Remote Performance.

Run high-volume IBM 3890 check processors from your home office mainframe. With PIXNET you can process 100,000 documents an hour at your remote site with no additional CPU power.

Print up to 60 pages a minute remotely with Paradyne's Remote High Speed Page Printer. Paradyne's PIXNET also improves the performance of remote high speed printers and IBM 3270s.

Call today and find out how we can put your remote devices on their best behavior.

1-800-482-3333

Paradyne Corporation
P.O. Box 1347 8550 Urmerton Road
Largo, FL 33540

paradyne

If your product or service belongs in the automated office, your ads belong in February's Computerworld Focus.

There's enough information about office automation to fill a book. And that's exactly what we'll be doing with February's issue of *Computerworld Focus*. Which makes it *must* reading for just about everyone involved in the state-of-the-art office. And must advertising for anyone with products or services to sell into the automated office.

Inside, your prospective buyers will find the valuable, objective information they need to make intelligent decisions.

They'll find out what the experts think in areas like planning and implementation strategies, technologies and product selection. We'll analyze everything that's available from software to hardware to communications to... you name it. We'll even show readers how to mix and match state-of-art with "old reliable" for the most effective information systems available.

And we'll reach over 126,000 paid *Computerworld* subscribers with that information. Not to mention our high pass-along readership. And bonus distribution at OAC '85 in Atlanta, GA.

But the value of your advertising dollar doesn't stop there. Because Starch INRA Hooper will be performing a detailed readership study* on our February issue. So you can see how effective your ads are. And how effective your competition's ads are. And make some decisions of your own.


So if you've got products aimed at the automated office, there's one sure fire way to make sure your advertising works. Get your ads in *Focus*. *Computerworld Focus*. The February 6th issue. Closing January 4th.

For more information, contact Ed Marecki, National Sales Director, *Computerworld Focus*, 375 Cochituate Road, Framingham, MA, 01701, (617)879-0700. Or call your nearest sales office, listed below.

COMPUTERWORLD FOCUS

BOSTON: (617) 879-0700 **NEW YORK:** (201) 967-1350 **CHICAGO:** (312) 827-4433 **ATLANTA:** (404) 394-0758
HOUSTON: (713) 952-1220 **LOS ANGELES:** (714) 261-1230 **SAN FRANCISCO:** (415) 421-7330

*A minimum size of 7" x 10" (500 lines) is required for ads to be eligible for a Starch study.

 A PUBLICATION OF
CW COMMUNICATIONS

COMPUTER INDUSTRY

TI to lay off 2,000; continued chip sales decline cited

DALLAS — Texas Instruments, Inc. recently announced plans to begin cutting approximately 2,000 jobs from its work force next month. The company cited the "continued weakening of the worldwide semiconductor market."

The TI development, which followed by one week Honeywell, Inc.'s announcement that it plans to lay off 1,000 people at its Synertek, Inc. semiconductor unit and intends to sell the subsidiary, indicates that semiconductor orders, which have slumped over the past few months, may not rebound as quickly as industry participants had expected [CW, Oct. 29].

The layoffs at TI will primarily af-

fect its Texas facilities, the company said. Additionally, reduced work schedules are being implemented in some plants, according to TI.

Reportedly, the job cuts will reduce by 5% the portion of TI's work force engaged in semiconductor manufacturing, the largest portion of the company's business.

TI said employees affected by the reductions will either receive severance pay or be placed on furlough. Those on furlough will receive compensation from TI to supplement unemployment compensation for up to 26 weeks and will continue to have benefits coverage during the period in which they receive the supplemental compensation.

Over the past few months, book-to-bill ratios, which compares new orders with shipments, reported by the Semiconductor Industry Association have plummeted to new lows. In September, the rate of new orders fell below shipments for the first time in two years and has slipped even lower since then.

Industry observers and participants told *Computerworld* in October that the decline was probably due to the tendency of systems developers to double-order from chip manufacturers during periods of high demand.

Those observers had expected the situation to level off by the end of the year. The recent developments, how-

ever, indicate that the situation has worsened and suggest that the industry may be poised on yet another of the cyclical slumps that it has traditionally suffered during a slowdown in economic activity.

SBS appoints IBM executive to presidency

MCLEAN, Va. — Satellite Business Systems (SBS) last week named Marvin L. Mann as its president and chief executive officer, replacing Steven B. Schwartz, who was appointed assistant group executive for IBM's Telecommunications Products organization in the Information Systems and Communications Group.

Mann was previously vice-president and general manager of IBM's Lexington Business Products unit in Lexington, Ky.

Schwartz has been assigned the role of overseeing the incorporation of the latest IBM acquisition — Rolm Corp. — into IBM's business operations. He will retain a role at SBS as a member of the executive committee.

IBM owns 60% of the SBS partnership, and Aetna Life & Casualty Co. of Hartford, Conn., owns 40%. IBM recently increased its ownership share of SBS, buying out one-third of the interest in the Communications Satellite Organization.

SBS is a nationwide telecommunications company serving more than 150,000 business and residential subscribers.

COURT from page 73

about the NCR Comten program to IBM in violation of federal licensing and copyright laws.

Since then, the impending courtroom battle has widened to include assertions by NCR Comten that IBM violated federal antitrust laws and a request by Evergreen for damages against NCR Comten, based on the allegation that it called Evergreen "an IBM spy" and damaged the firm's future business.

Evergreen lawyer James Keir claimed "Evergreen just got caught in the middle." The company was doing a straightforward investigation, he said, asking several manufacturers, including NCR Comten, to provide technical manuals for devices competing with the IBM 3705 when the alleged violation was discovered.

NCR Comten attorney Raymond Fitzsimmons said no definite date has been set for the trial, which is expected to begin early next year.

Mark Steinberg, a spokesman for O'Melveny & Myers, the Los Angeles-based legal firm representing IBM in the case, said Evergreen "acted properly in reporting the apparent theft of IBM's property" by NCR Comten. Steinberg would not comment on IBM's strategy but claimed that NCR Comten's allegations are "without merit" and that "IBM plans to respond vigorously to [NCR Comten's] antitrust allegations."

Why the time has never been better to get your own subscription to Computerworld.

FREE CLOCK WITH YOUR SUBSCRIPTION.



Subscribe to *Computerworld* now, and we'll send you this miniature, personal computer clock. Free. The clock displays the date, the hour, minute and second, and makes a handsome desk-top piece for your office.

And as we said, it's a gift from us to thank you for becoming a new subscriber to *Computerworld*.

51 ISSUES OF COMPUTERWORLD

In addition to the free timepiece, of course, you'll receive our regular 51 issues of *Computerworld*. So you won't have to wait for a co-worker's copy to keep up-to-date on what's taking place in the industry.

YOU'LL ALSO RECEIVE SPECIAL FOCUS ISSUES

As a *Computerworld* subscriber, you'll also receive our highly-acclaimed *COMPUTERWORLD FOCUS* issues — at no extra charge. Published once a month (except July and December), these bonus issues focus on a single topic. Here is a sampling: UNIX™, Office Automation, Microcomputer Software, Business Graphics, Applications Software, Manufacturing, Networks, Systems Software, Microcomputer Hardware. *COMPUTERWORLD FOCUS* helps you plan, purchase, and save money. And these bonus issues are sent only to *Computerworld* subscribers — it's like getting a subscription to a second magazine FREE!

As you can see, there are plenty of reasons to subscribe to *Computerworld*. So don't rely on someone else to lend you theirs. Be well-informed — with 51 issues of *Computerworld* plus the *COMPUTERWORLD FOCUS* issues — without having to wait.

Now you know why the time has never been better to subscribe to *Computerworld*.

UNIX is a trademark of AT & T Bell Laboratories.

☐ **Yes!** Please enter my subscription for one full year (51 issues) of *Computerworld* at \$44. Plus all 10 *COMPUTERWORLD FOCUS* issues at no extra charge... plus my FREE gift with my paid subscription. (Please allow 6-8 weeks for shipment of your free gift.)

Subscription Form

First Initial Middle Initial Last Name

Your Title

Company Name

Address

City

State

Zip Code

☐ Bill me

☐ Payment enclosed. Send my FREE clock immediately.

☐ Charge to my credit card and send my FREE clock immediately.

☐ AmEx

☐ BA/VISA

☐ MC

Expiration Date

(MC Only List four digits above your name.)

Signature

If you are using a credit card, you can enter your order by calling TOLL-FREE: 1-800-343-5730 (In Massachusetts, call collect: 617-879-0700.)

Address shown is: ☐ Home ☐ Business

☐ Check here if you do not wish to receive promotional mail.

Satisfaction Guaranteed On Paid Subscription:

I understand that I may cancel my subscription at any time (discontinuing the bonus issues), and request a full refund of the unused portion of my subscription and keep the clock.

Please indicate your business, title, and computer involvement below. Circle one number in Categories 1 and 2 and all that apply in Category 3.

1. BUSINESS/INDUSTRY

End User

10. Manufacturer (other than computer)

20. Finance/Insurance/Real Estate

30. Medicine/Law/Education

40. Wholesale/Retail/Trade

50. Business Service (except DP)

60. Government — State/Federal/Local

70. Public Utility/Communication Systems/Transportation

80. Mining/Construction/Refining/Other

90. Other User

(Please Specify)

11. Manufacturer of Computers, Computer-Related Systems or Peripherals

21. Computer Service Bureau/Software/Planning/Consulting

31. Computer/Peripheral Dealer/Distributor/Retailer

41. Other Vendor

(Please Specify)

2. OCCUPATION/FUNCTION

11. President/Owner/Partner/General Manager

12. VP/Assistant VP

13. Treasurer/Controller/Financial Officer

21. Director/Manager/Supervisor DP/IMS Services

22. Director/Manager of Operations/Planning/Admin. Serv.

23. Systems Manager/Systems Analyst

31. Manager/Supervisor Programming

32. Programmer/Methods Analyst

35. QA/QIP Director/Manager/Supervisor

36. Data Comm. Network/Systems Mgmt.

41. Engineer/Scientific/R&D/Technical Mgmt.

51. Manufacturing Sales Rep./Sales/Marketing Mgmt.

60. Consulting Management

70. Medical/Legal/Accounting/Management

80. Educator/Journalist/Librarian/Student

90. Other

(Please Specify)

3. COMPUTER INVOLVEMENT

Types of equipment with which you are personally involved either as a user, vendor or consultant (circle all that apply).

A. Mainframes/Superseries

B. Minicomputers/Small Business Computers

C. Microcomputers/Desktops

D. Communications Systems

E. Office Automation Systems

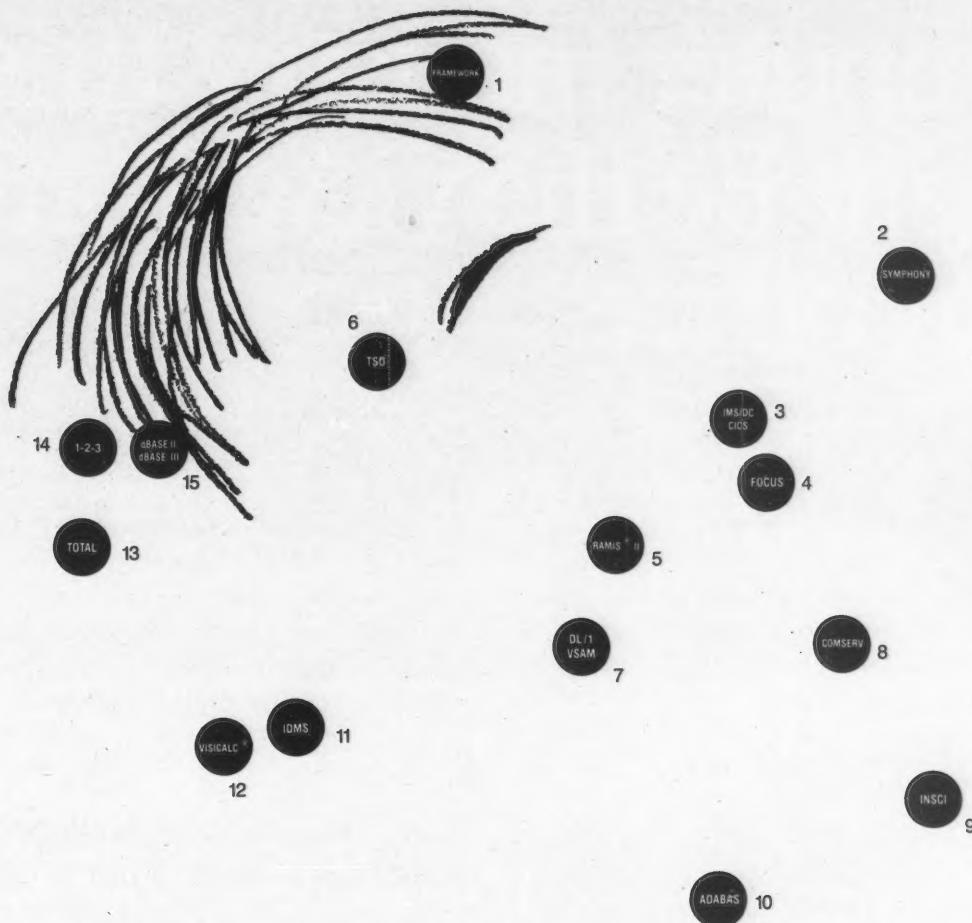
(Please Specify)

Fill in and return to:

375 Cochituate Road, Box 897, Framingham, MA 01701

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Only Answer/DB connects all these dots.



The more mainframe access you give your users, the happier they'll be.

They'll be more productive, too.

Answer/DB® is fast becoming the industry standard for universal data access. It addresses every mainframe file with a single, easy-to-learn language.

Users can get answers to simple queries on-line. It makes them more efficient, and your company more competitive.

Answer/DB operates in OS and DOS, interfacing with all database structures—in TSO, IMS/DC or CICS environments.

Users can integrate data from several files and generate detailed reports and inquiries—without DP help.

They can even download data to personal com-

puters, where they can use it in the familiar PC programs they already know. Answer/DB interfaces with LOTUS®/Answer™, dBASE™/Answer™ and VisiAnswer™.

Answer/DB frees DP staff from routine tasks and request bottlenecks. But it keeps control of the mainframe resources and complete security at the DP level, where it belongs.

If you'd like to sample Answer/DB, without the pressure of a presentation, mail this coupon. We'll send a demonstration package, free of charge.

In less than an hour, you'll see that Answer/DB is powerful enough to deliver all the data your users need.

Yet so easy, it's almost child's play.

Yes, happier users sure would be nice. Send me a free Answer/DB demo package.

NAME _____ TITLE _____

COMPANY _____

PHONE () _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

I AM INTERESTED IN END USER:

☐ REPORTING ☐ INQUIRY ☐ MICRO-MAINFRAME LINK

MAINFRAME TYPE _____ OPERATING SYSTEM ☐ OS ☐ DOS

TP MONITOR ☐ IMS/DC ☐ TSO ☐ CICS _____ OTHER _____

MICROCOMPUTER TYPE _____

MAIL TO: ANSWER/DB DEMO PACKAGE

P.O. BOX 1452, CAMOGIA PARK, CA 91304

CW12/17/84

VisiAnswer is a U.S. Registered Trademark of VisiCorp. VisiCalc is a trademark of Software Arts, Inc. dBASE II, dBASE III and Framework are Trademarks of Ashton-Tate. Lotus 1-2-3 and Symphony are Trademarks of Lotus Development, Inc. RAMS II is a registered servicemark of Mathematica Products Group, Inc. Answer is a registered Trademark of Informatics General Corporation.

 **informatics**
general corporation.

If the space program had advanced as fast as the computer industry, this might be the view from your office.

And space stations, Martian colonies, and interstellar probes might already be commonplace. Does that sound outlandish? Then bear these facts in mind:

In 1946 ENIAC was the scientific marvel of the day. This computer weighed 30 tons, stood two stories high, covered 15,000 square feet, and cost \$486,840.22 in 1946 dollars. Today a \$2,000 kneetop portable can add and subtract more than 20 times faster. And, by 1990, the average digital watch will have as much computing power as ENIAC.

The collective brainpower of the computers sold in the next two years will equal that of all the computers sold from the beginning to now. Four years from now it will have doubled again.

It's hard to remember that this is science fact, not fiction. How do people keep pace

with change like this? That's where we come in. We're CW Communications, Inc.—the world's largest publisher of computer-related newspapers and magazines.

Every month, over 9,000,000 people read one or more of our publications

Nobody reaches more computer-involved people around the world than we do. And nobody covers as many markets. In the United States we publish three computer/business journals. *Micro Marketworld*, for businesses selling small computers and software. *On Communications*, the monthly publication covering the evolving communications scene. And *Computerworld*, the newsweekly for the computer community, is the largest specialized business publication of any kind in this country.



We also offer seven personal computer publications. *InfoWorld*, the personal computer weekly, is a general interest magazine for all personal computer users.

The other six are monthly magazines that concentrate on specific microcomputer systems. *PC World*, the comprehensive guide to IBM personal computers and compatibles. *inCider*, the Apple II journal. *Macworld*, the Macintosh magazine. *80 Micro*, the magazine for TRS-80 users. *HOT CoCo*, the magazine for TRS-80 Color Computer and MC-10 users. And *RUN*, the Commodore 64 & VIC-20 magazine.

And we have similar publications in every major computer market in the world. Our network of more than 55 periodicals serves 25 countries. Argentina, Australia, Brazil, Canada, Chile, Denmark, Finland, France, Greece, India, Italy, Japan, Korea, Mexico, The Netherlands, Norway, People's Repub-

lic of China, Saudi Arabia, Southeast Asia, South Africa, Spain, Sweden, United Kingdom, United States, and West Germany.

The sooner we hear from you, the sooner you'll hear from our readers

Simply put, we'll make it easy for you to reach your target audience—and for them to reach you. Call today for more information. You'll find the number below.



CW COMMUNICATIONS/INC.

375 Cochituate Road, Box 880, Framingham, MA 01701
(617) 879-0700

COMPUTER INDUSTRY

AEA from page 73

that the answer to that question is basically no — though there are differences on how to get at a solution. In its latest report on the situation, the AEA warned that a shortage of engineering faculty at U.S. universities may lead to a decline in the quality of electrical and computer science engineers. With not enough engineering teachers to fill vacant teaching slots, some engineering schools have had to turn away qualified high school applicants, the AEA said.

The AEA has been troubled by the problem for some time. A 1981 study by the AEA projected a shortage of 129,000 electrical and computer science engineers by 1985. Yet another study, issued last year using data compiled during the recession

months of early 1983, pegged the shortage at 113,000 by 1987.

The latest study noted that, in the past decade, enrollments of engineering students have doubled, while the number of engineering faculty has risen just 10%.

According to the study, this imbalance has meant more crowded classrooms, course cancellations, increased teaching loads, less time for faculty research and more dependence on part-time faculty and teaching assistants.

In the AEA's view, a resolution to the faculty and student shortages is essential if American computer companies are to stay economically competitive. "A sufficient faculty supply is essential both to the quality and quantity of these [engineering] graduates," concluded Pat Hill Hubbard, the AEA's vice-president of engi-

neering and technical education, who prepared the report.

But is the engineering shortage really as big a problem as the AEA purports? Like the AEA, the National Science Foundation concluded in its own recent study that the demand for computer and electrical engineers and computer scientists will grow by 10% to 15% during the next several years, and that there will be a significant shortage of computer scientists. The science foundation, however, foresaw that the shortage of engineers will be met by people crossing over into the field from other occupations.

The AEA is not convinced that the shortage problem can or should be resolved in the way proposed by the science foundation. So the trade association has worked to tackle the problem by its own methods.

AEA member companies have contributed \$7 million through the AEA's Electronics Education Foundation. This money goes mainly to fund loans and fellowships for doctoral students in electrical or computer engineering or computer science. More than 120 graduate students at more than 30 universities are now receiving these fellowships. The AEA believes that without an increasing number of U.S. citizens receiving Ph.D.'s in engineering, more faculty posts will continue to go to foreign-born Ph.D.'s.

In other efforts, the AEA has lobbied federal and state lawmakers to raise salaries of engineering faculty, to provide tax incentives for corporations donating computer equipment and to provide matching grants with state legislatures to fund a variety of higher education initiatives.

Announcing

The one-stop, international advertising service for micro marketers.

You'll reach microcomputer buyers all over the world with *Computerworld's* International Marketing Service (CWIMS). Because we have the microcomputer market covered with an international network of publications. And what a market!

As the need for computerization in government, industry and educational systems all over the world becomes more acute, countries look to the cost-effective, adaptable microcomputer to bring them into the computer age. This means a very lucrative market for the U.S. micro marketer, since international product demand exceeds product supply.

Now, with the help of *Computerworld's* International Marketing Services, you can advertise in twenty magazines devoted exclusively to supplying information to microcomputer users in: Australia (*MicroWorld*, *Australian PC World*), Brazil (*MicroMundo*), Canada (*PC World Canada*), Denmark (*Micro Verden*), Finland (*Mikro*), France (*Golden*, *OPC*), Japan

(*PersoCom World*), Mexico (*Compu Mundo*), Norway (*Mikro Data*, *PC Mikrodata*), Sweden (*MicroDatorn*, *Min Hemdator*), Spain (*Micro Sistemas*), Sweden (*Svenska PC World*), The Netherlands (*Micro/Info*), West Germany (*MicroComputerwelt*, *PC Welt*, *Run*).

And your advertising message can reach buyers of microcomputer products and services around the world through special micro sections in any of over 40 publications in 25 countries.

Act now—and take advantage of this international demand for microcomputer products. Whether you want to test the market—or locate a distributor or representative—our publications will put you in touch with the right people around the microcomputer world.

For more information on getting international micro coverage, call Diana La Muraglia, General Manager, International Marketing Services, toll-free, at 800-343-6474. In Massachusetts, call 617-879-0700 or return the coupon below.



Diana La Muraglia, General Manager
International Marketing Services
CW Communications/Inc.
375 Cochituate Road, Box 880
Framingham, MA 01701

Please send me information on your:

☐ Microcomputer publications ☐ Your other foreign publications

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

ROBOTS from page 73

the RIA said, indicates that total 1984 shipments will reach \$290.3 million or more, compared with total 1983 shipments of \$194.4 million.

"More robots have been shipped in 1983 and 1984 [combined] than in the previous 20 years combined, dating back to the development of the technology," Weisel noted. RIA figures show that 3,060 robot units were shipped in 1983, and at least 3,951 will have been shipped in 1984.

Based on new orders, the RIA said, the average price of an industrial robot dropped from \$74,100 in 1983 to \$59,200 in mid-1984. Weisel attributed the price cuts mostly to stiff competition in the U.S. market and, to a lesser extent, economies of scale in robot manufacturing.

He added that while prices have dropped about 20%, there has been a concurrent 20% increase in robot capabilities, due to advances in software, computer interfacing and sensory abilities.

Weisel and Vincent said the number of industrial robots installed in the U.S. has risen from 9,400 in 1983 to about 13,000 today, a number still far below the 41,000 robots installed in Japan. Vincent asserted that the U.S. robots tend to be more sophisticated technically and have better applications software than the Japanese robots.

Because the Japanese government subsidizes its robot industry, Vincent said, the U.S. industry will ask Congress in 1985 for tax incentives to improve its competitive position.

Robert Smith, RIA's lobbyist here, expressed concern that the Department of the Treasury's recent proposal for business tax reform would sharply reduce the ability of manufacturing industries to invest in robot systems. He cited the proposals to eliminate the 10% investment tax credit and the accelerated depreciation schedule that was enacted in 1981 (CW, Dec. 10).

On another subject, the RIA officials said that robots will not cause substantial unemployment in the next few years because robots typically replace other equipment rather than human laborers, and employment in the robotics industry itself now outstrips any unemployment caused by the robots. However, the officials stressed that worker retraining programs are needed to prevent widespread job displacement in the next century if a robot boom develops.

POSITION ANNOUNCEMENTS

VALLEY NATIONAL BANK OF ARIZONA has current openings for professionals in an IBM State of the Art environment. Current openings include:

SENIOR SYSTEMS SOFTWARE SPECIALIST

Valley National Corporation is a large tele-processing and systems user. Current systems include such software as MVS/XA, IMS 1.3/FAST PATH, and currently examining MSC/ISC. An immediate opening is available in an area of major growth in the Corporation, CICS. An experienced technical individual (3-5 years) is needed who can participate in application design reviews, project management contacts, and performance and tuning. The position includes contact with user areas and a required knowledge of good verbal and written skills. Opportunities for career growth and knowledge of other online systems if desired are available for the self-starter.

LEAD SYSTEMS SOFTWARE SPECIALIST

A current need exists for a project leader in online Systems Software (IMS, CICS). The qualified individuals background must include first-line supervision, good communications skills (including formal presentations) and project management skills. This position provides technical leadership to technicians responsible for supporting, enhancing, and tuning the online environment.

SENIOR OR LEAD SYSTEMS SOFTWARE SPECIALIST

Position exists for experienced VM Systems programmer. The qualified individual would possess 3+ years installation, maintenance, and enhancement of IBM's VM/SCP, strong assembler skills, knowledge of VM communications facilities with exposure to ASCII interfacing. Preferred skills include OS/VS1, MVS, VTAM and knowledge of capacity and performance management.

If interested in these career opportunities, please submit resume and salary history in confidence to:

Scott Manning
201 N. Central Ave.
P.O. Box 71-A301X
Phoenix, AZ 85001

Equal Opportunity Employer Member FDIC

MOVE STAY SOUTH NOW!

Our computer can help you get here or stay here. Four WATS lines; 13 years' experience; 270 affiliated offices; 300+ current job orders; 3000+ company clients from Virginia to Texas to Florida! Send resume to:

DATA RESOURCES, USA

Division of Landrum Personnel Resources
P.O. Box 1373C
Pensacola, Florida 32596-1373
CALL TOLL FREE (800) 874-4047
IN FLORIDA (904) 454-2391 COLLECT



For data processing
brain-power
think of EDPeople,
a service of Robert Half.

Intelligent machines need intelligent people.
And Robert Half has been finding these people
since the computer revolution began.

We know the job market,
and we know the right people
to meet your EDP requirements.

Call any of Robert Half's 80 offices
in the United States, Canada and Great Britain.
We'd like to help you hire smart.



© 1983 Robert Half International Inc. All offices independently owned and operated

ELIZABETHTOWN COLLEGE Director of Computer Services

The Director of Computer Services is responsible for leadership in academic and administrative computing services, for long-range planning and creative applications of the computer on campus, for budgeting and management of the computer center, and for effectively communicating to and with users with diverse needs. The college has two VAX systems, a computer science program with 120 majors, and a large faculty/student user group. The Director reports to the President. A masters' degree and at least three years' experience in an academic institution preferred. The position is available immediately or can be assumed during the summer 1985. Salary negotiable. Letter of application, three letters of reference, and transcripts to Mrs. Martha A. Farver-Appar, Director of Personnel, Elizabethtown College, Elizabethtown, PA 17022.

Application deadline, February 28, 1985.

An affirmative action/equal opportunity employer.

SUNSHINE CONNECTION

Several hundred positions available throughout Florida & the Sunbelt
All Expenses Paid
Our clients, in urgent need of your expertise will pay all your expenses in relocating you to an area of Sun & Fun. Call now or send resume in confidence. Here since 1969.

COMMUNICATION PROGRAMMERS
PROGRAMMER ANALYSTS
SYSTEMS PROGRAMMERS
DATA BASE ANALYSTS
"Specialists in Banking"

AVAILABILITY, INC.
813 872 2851
Dept. C, P.O. Box 23434
Tampa, Florida 33622

Systems Programmer

Responsible for systems software installation and maintenance in an IBM dual CPU environment (4381/4341) utilizing DOS/VSE under VM/SP with extensive communications network. Thorough knowledge of CICS required. Additional software includes TOTAL, VOLLIE, and Computer Associates family of products. System tuning and performance monitoring experience helpful. Successful candidate will have a minimum of 5 years experience. Send resume with salary history to:

Fairfax Hospital Association
Personnel Office
8001 Braddock Road
Springfield, Virginia 22151

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS



CHALLENGES IN MANAGEMENT INFORMATION SYSTEMS

YOUR FUTURE may be with CALDOR'S rapidly developing M.I.S. Department bringing us both to the verge of tomorrow's state-of-the-art. We are searching for professionals who have the expertise, drive and commitment that will enable us to rapidly expand our environment to include IBM 308X, OS, MVS, Data Base, VTAM, CICS, and an extensive communications network gathering financial, inventory and personnel information.

OPPORTUNITIES FOR:

- Project Managers •System Analysts
- Programmer/Analysts
- Data Base Analysts •Systems Programmers

Caldor, a division of Associated Dry Goods Corp., is one of this nation's most dynamically expanding retail operations having sales well in excess of \$1 billion with 103 stores in 7 northeastern states. Anticipated expansion will take us to 150 stores and the \$2 billion sales range within the next 5 years. This dramatic, growth oriented environment coupled with our commitment to develop a staff that can provide the sophisticated data critical for our continued success makes Caldor the place for those seeking serious career challenge and personal rewards.

For prompt, confidential consideration send your resume or letter of interest to our Data Center, attention: William Christie, V.P. of MIS, Dept. 300, Caldor Inc., 20 Glover Ave., Norwalk, CT 06852.

CALDOR

103 Great Department Stores
expanding throughout the Northeast

SENIOR SYSTEMS ANALYST

Research Medical Center is a 583 bed hospital with a progressive environment designed to meet the specialized health care needs of Kansas City.

We currently have a position available in the Data Processing Department for a Senior Systems Analyst with 3-5 years experience in design and implementation of large scale systems in a distributed D.P. environment. Your exposure to and knowledge of PC's will be an asset. We are an IBM 4341 DOS/VSE shop supporting data base technology in utilizing ADABAS, NATURAL, COBOL, and CICS products.

Research Medical Center offers a competitive salary and excellent benefits including a child development center on the hospital grounds as well as access to our corporately owned fitness center. For confidential consideration, send your resume to Sharon Baker, Employment Interviewer.



RESEARCH MEDICAL CENTER
2316 E. Meyer Blvd.
Kansas City, MO 64132

An Equal Opportunity Employer M/F/H

DIRECTOR OF MIS

Progressive, medium sized organization in the sunbelt is seeking a dynamic individual to take over as its Director of MIS. The successful candidate will play a major role in expanding the company's current computer based information system. Position involves a high degree of visibility and responsibility, coordinating activities across departmental lines. Direct supervision of a small professional/technical staff and contractors in development and operation of multimillion dollar system for real time operations control and management information. Requires bachelor's degree in computer science or related field and at least 5 years of applicable experience to provide a comprehensive knowledge of business data systems. Salary from the mid 30's to 40's plus excellent fringe benefits. Send confidential resume with salary history to Personnel Dept., P.O. Box 12489, San Antonio, Tx. 78212.

Data Base Administrator

SMUD

Sacramento Municipal Utility District

Sacramento, located between San Francisco and the Sierras, has enough sunshine year-round to enable us to build the world's largest experimental solar energy project. Our median housing cost of \$78,000 and low utility costs help make us one of the top 10 hot growth spots in the U.S.

We have an immediate vacancy for a professional DBA to be at the front end of corporate DB design/installation/maintenance. We have a progressive data processing department with a large IBM Main Frame (3083), IDMS Software and MVS JES 3, so IDMS Software experience is very desirable.

We provide excellent benefits and civil service retirement system.

Obtain a SMUD application and file immediately for early consideration, but this announcement will be open until we find the right person for the job. Contact SMUD Personnel, 6201 S Street, P.O. Box 15830, Sacramento, CA 95852-1830. We are in a growth mode! Equal opportunity employer.

Personal computer users:

FOR FREE ACCESS TO A BETTER JOB CALL CLEO.

EASTERN U.S.: (201) 688-5599
(301) 982-0224
WESTERN U.S.: (213) 618-8800
(408) 294-2000 (415) 482-1550
(619) 224-8800 (714) 476-8800
(818) 991-8900
300 BAUD, Full Duplex,
ASCII code
For 1200 BAUD #'s and access
assistance: (213) 618-1525
Advertisers call (800) 621-9147.
In California, call
(800) 328-2263.

CLEO

Computer Listings of Employment Opportunities

SENIOR DATABASE PROGRAMMER.

Develop and enhance real estate property ownership record-keeping and examination system, utilizing Relational DBMS engineering, INGRES V3.0, EQUIL/Fortran plus enhanced SQL languages, and INGRES Subsystems Forms Facilities, running VAX-11/780 VMS operating system. Convert and maintain multi-county Title Plant systems based on Record Management Services knowledge and relational methodology, and incorporate the ability to maintain listing authorities, owner/property parcel data, digitized mapping coordinates and property appraisal data with VAX-11 Basic. Masters in Computer Science, 6 mos. exp. in job offered or 1 yr. exp. as Programmer, minimum 2 yrs. exp. with VAX-11, VAX Basic, languages, and knowledge in Relational Data Bases and Record Management Services. 40 hrs./wk.; \$23,751/yr. Apply at Texas Employment Commission, Houston, Texas or send resume to Texas Employment Commission, TEC Building, Austin, Texas 78778. Job Order #3943229. Ad paid for by an Equal Employment Opportunity Employer.

**SOFTWARE DEVELOPMENT
ENGINEER** for development of software for analysis and computer solution of image processing problems such as machine part identification, quality control, tolerances, and robotic development. Must have a Master's of Science in Computer Science with academic background in image processing, with at least 6 credit hours. Salary \$27,000 per year, 40 hours per week. Send resume to: MESCC, Room 415, 7310 Woodward Avenue, Detroit, MI 48202. Reference #48284. This is an employer paid ad.

LEAD SYSTEMS PROGRAMMER

A leading producer of enamel papers for the printed communications industry has an excellent opportunity available in Central Wisconsin. This person reporting to the software support manager will design, modify, maintain and install operating systems, communication systems and vendor supplied software on an IBM 4381 machine. This person carries out the most complex, highly technical systems programming work; provides training to others; analyzes and corrects problems; provides complete documentation; participates in post audit analysis; and provides user support.

B.S. degree in Computer Science, Math, Business Administration or related area and at least 3 years of advanced-level systems programming experience with MVS and CICS.

Excellent employee benefits. Liberal relocation program. Send resume and salary requirements to:

Bert E. Johnson
Professional Employment Manager
CONSOLIDATED PAPERS, INC.
P.O. Box 50
Wisconsin Rapids, WI 54484
NO THIRD PARTY INQUIRIES, PLEASE
An Equal Opportunity Employer M/F/H/V



INFORMATION ANALYST

The University of Georgia Department of computing and Information Services has a job vacancy for an Information Analyst. Responsibilities include functioning as an analyst and team leader for design and implementation of administrative applications. Systems use relational databases and fourth generation languages and allow for the interaction of mainframes and micros. Work experience in system design, implementation and DBMS. Knowledge of CICS helpful. Send resume to: Ms. Dawn Dukes, Employment Department, University of Georgia, Athens, GA 30602. An Equal Opportunity/Affirmative Action Institution.

Software Engineer

- Anal. users requ.; design & dev. customized software; participate in engineering of ind. control sys.; use PDP 11/44 & TI 990/112, FORTRAN, PASCAL. B. Deg. in E.E.; 18 mo. exp. doing above or as Prog./Anal. T.A. using above and/or UNIVAC 90/80 & Interdata 7/32. 40 hrs./wk. \$34K/yr. Employer paid ad. Send resume: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Reference # 42884.

HIRING?

More computer people read Computerworld than any other newspaper in the United States - more than half a million computer people every week. And, among our 529,650 readers at user organizations, about half claim to look at recruitment ads at least every other week (only a small percentage say they never look at recruitment ads). No wonder Computerworld carries more recruitment ads for computer people than any other publication. To place your ad or to get a rate card with complete details on Computerworld Classifieds, call or write:

**Classified Advertising
Computerworld
Box 880
Framingham, MA 01701
1-800-343-6474 617-879-0700**

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

USAA & SAN ANTONIO

A dynamic environment, and a good place to be.

United Services Automobile Association (USAA) is San Antonio's leading insurance and financial services corporation with assets exceeding \$3.0 billion. We are also the city's largest private employer, including a workforce of 6,000 employees at headquarters alone. What makes us so highly desirable to work for is apparent in our unique business environment — 18 acres of high-tech office space on 236 acres of campus-like surroundings structured to provide every personal convenience and professional need.

We are seeking systems programmers and systems performance experts with experience in one or more of the following:

**IBM MVS, IMS, CICS, SERIES 1, SYSTEM 36, SYSTEM 38
DATAPOINT
HEWLETT PACKARD 3000
DIGITAL VAX VMS**

Company offers excellent benefits, growth potential and relocation package.

Send resume including salary history to:

**Employment and Placement: 1202R
Gene Rowley
USAA
USAA Building
San Antonio, Texas 78268**

We are an equal opportunity employer



THE ALAMO, SAN ANTONIO, TEXAS

data processing

SYSTEMS PROGRAMMER

Exxon Nuclear, a Washington State based company specializing in nuclear fuel engineering and manufacturing, has an opening for a Systems Programmer with ten or more years experience in programming and analysis including four years of systems programming with emphasis in IBM operating system maintenance, performance tuning and problem resolution. Knowledge of VM, MVS, CICS, DF/EF, SAS, AC/F2, VSAM, CMS, JFS2, TSO, ISPF, Assembler required. BS in Computer Science or other technical area highly desirable.

Maintain MVS via CBIPO and VM/SP on an IBM 4381. Install AC/FVTAM. Act as lead System Programmer and have principal responsibility for product evaluation and justification. This is a critical technical position in a growing center. Excellent interpersonal skills required.

Qualified and interested candidates please send resume and salary requirements to Exxon Nuclear Company, Inc., Employee Relations Department, Mail Slot 13, 2101 Horn Rapids Road, Richland, WA 99352. We are an equal opportunity employer.

**EXXON NUCLEAR
COMPANY, INC.**

EMPLOYMENT SERVICE FOR PROGRAMMERS AND ANALYSTS

National Openings With Client Companies and Through Affiliated Agencies

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer marketing and support
Call or send resume or rough notes of objectives, salary, location restrictions, education and experience (including computers, models, operating systems and languages) to either one of our locations. Our client companies pay all of our fees. We guide you, you decide

RSVP SERVICES, Dept. C
Suite 700, One Cherry Hill Mall
Cherry Hill, New Jersey 08002
(609) 667-4488

RSVP SERVICES, Dept. C
Suite 211, Dublin Hall
1777 Walton Rd., Blue Bell, PA 19222
(215) 629-0595

From outside New Jersey, call toll-free 800-222-0153

RSVP SERVICES

Employment Agents for Computer Professionals

Institute Of Public Administration Kingdom of Saudi Arabia

Has vacant faculty positions for male & female holders of Ph.D. or Master's degree in the following disciplines:

- | | | |
|--------------------------------------|--------------------------------------|----------------------------|
| (1) Management | (2) Statistics | (3) Mathematics |
| (4) Quantitative Methods | (5) Accounting | (6) Law |
| (7) Economics | (8) Computer Science | (9) Information Science |
| (10) Research Methodology | (11) Business Education | (12) Industrial Management |
| (12) Logistics/Material Management | (13) Project Management & Evaluation | |
| (14) Hospital/Health Admin. | | |
| (16) Library & Documentation Science | | |

The applicants are expected to teach, and do research and consultation work at the Institute's headquarters in Riyadh or in one of its branches in Jeddah and Dammam; or the women branch in Riyadh for female candidates.

The language of instruction at the Institute is Arabic.

Fringe Benefits:

In addition to the monthly salary, the IPA provides the following fringe benefits:

- Annual round trip tickets to the contractee and his/her family.
- Furnished accommodation.
- Monthly transportation allowance.
- Luggage transportation allowance on appointment.
- End-of-service gratuity.
- Remunerations for studies, researches, and translation works.
- Free medical treatment of the contractee and his/her family members.
- Contribution in the educational fees for children who are permanent residents of non-Arab countries.

Those interested are requested to send their academic & experience certificates, along with a resume showing their previous experience in teaching, research and consultations in their respective fields, and references, to:

**The Director General
Administration & Financial Affairs
Institute of Public Administration
P.O. Box (205), Riyadh 11141
Kingdom of Saudi Arabia**

Applicants are required to give their addresses and telephone numbers in order to be easily notified of the date of personal interview upon initial approval.

THE PENNSYLVANIA STATE UNIVERSITY

Continuing faculty positions in computer science at a number of The Pennsylvania State University's branch (2-year) campuses beginning in August 1985. Candidates should be genuinely interested in teaching lower-division baccalaureate and service courses. COBOL-oriented courses add considerable spice to the teaching diets at several of these campuses at which an associate degree is offered. M.S. in computer science is required; demonstrated desire for continued scholarly growth weighted heavily. Please indicate specifically if interested in an assignment involving associate degree program. A letter of application with resume and names of three people who may be contacted as references should be sent to Dr. Fred L. Bery, Computer Science Department, Box 202AA Whitman Lab, University Park, PA 16802. Deadline is March 15, 1985. AN EQUAL OPPORTUNITY AFFIRMATIVE ACTION EMPLOYER.

SR. PROGRAMMER ANALYSTS

SYSTEMS ANALYSTS

Exciting things are happening at this growing service organization and you can be part of it! An immediate need for 2 Sr. Programmer Analysts with experience in the following areas: Systems Design & Testing, Structured COBOL, Cradle-to-Grave systems life-cycle, solid understanding of Data Base principles and good communication skills. This is a high-visibility position with excellent exposure to upper mgmt. Very good rewards for those with IBM background preferred. Excellent relocation package. Salary to \$40,000. Call or write for details.

Randy Pace or Warner Colman

ROBERT HALF
OF ST. LOUIS

7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

DIRECTOR OF COURT COMPUTER SERVICES

The Circuit Court of Jackson County, Missouri at Kansas City has an immediate opening for a highly qualified and experienced Director for its Data Processing department. The present incumbent is an IBM 4381. There are 25 personnel on the data processing staff. Must have quality experience in systems analysis and design, budget management, cost/benefit analysis, and management in all phases of data processing operations. Degrees should be in Computer Sciences, Management, or a related field. Salary is commensurate with experience. Submit resume, salary history, and salary requirements to: Circuit Court of Jackson County, Department of Personnel, 415 East 12th Street, 10th Floor, Kansas City, MO 64108.

EOE M/F

DATA PROCESSING MANAGER

\$2,452 - \$3,448 per month
Prefer bachelors degree in Computer Science or Systems or a related field, 5 years experience in data processing; 3 years in programming; at least 2 years as a supervisor. Sperry System 80 or equivalent experience. Application deadline January 7, 1985.

City of Palm Springs Personnel
P.O. Box 1786
Palm Springs, CA 92263
(619) 323-4215

Call for City Application. No resumes. Postmarks unacceptable. EOE/AA.

THE SCHUMANN CONSULTING GROUP

We are a well respected consulting group with about 300 employees. For the past 13 years, we have been providing a wide variety of services in the fields of management, organization and data processing on behalf of important clients in West-Germany, Italy, Spain and abroad. Within the field of EDP, especially system consultancy, we are among the leading companies in Europe. We are now considerably expanding our Systems Consulting Section and are therefore looking for several new members of staff.

WE REQUIRE:

SYSTEM SPECIALISTS

to handle interesting and demanding system-related assignments using IBM equipment.

You should have the following qualifications:

- detailed knowledge and several years of experience in one of the following fields:
 - Networks, especially SNA and VTAM
 - MVS system programming and tuning
 - DOS/VSE system programming and tuning
 - Migration: DOS to MVS
 - Data communications, especially CICS
 - Capacity planning
- sound theoretical training with an academic degree or equivalent in mathematics, computer science or engineering
- wide experience in system programming and generation
- practical experience in installation and management of DB/DC systems
- good knowledge of English and at least basic German

Successful candidates will not only have the necessary professional experience, but also the ability to apply their particular experience as skilled consultants. They will also need flexibility, willingness to expand their professional knowledge, as well as the drive and ability to work as team members.

We are offering attractive salaries and results-oriented bonuses. Please write, quoting the above reference, and enclosing all relevant credentials. For further information contact Mr. Tuechter. Tel.: Cologne: 0221/798091-(95).

All applications will be treated confidentially.

INC

AG, Raderberger StraBe 182
5000 Koeln 51, W. Germany

WASHINGTON, D.C.

OPPORTUNITY CALLS! S/38

\$5 bill on fast growing metro DC seeks a skilled Programmer/Analyst. Must develop new systems and work with senior management. RPG III and CL required. Growth opportunity! \$37K

ROBERT HALF

OF WASHINGTON, INC.
7316 Wisconsin Ave. Ste 401
Washington, D.C. 20014
(301) 682-1960

UNIX*

National Registry
of UNIX* job
openings & professionals

P.O. Box 19949, Dept. CWU
Houston, TX 77224
Please send resume.

Scientific Placement, Inc.
800-231-5920
UNIX is a registered trademark of AT&T

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

WE'LL MATCH YOUR SALARY. RAISE IT. AND, GIVE YOU TIME AND A HALF FOR OVERTIME.

Allen Services knows top-notch programmers and analysts are a sure bet to the success of our national contract consulting business. So we up the ante in salaries and benefits to get the qualified consultants we need to satisfy our consulting contracts.

- Paid vacations and holidays • Health and life insurance • Dental insurance • Per diem allowance • Between project pay • Merit reviews • Technical challenge • Professional growth • Constant up-grading of skills • Excellent salaries • Superior benefits...

Don't gamble with your career. Deal yourself a winning hand with Allen: Call us today 800-543-7583. In Ohio, call collect 513-890-1200. (SUBCONTRACTORS WELCOME)

ALLEN SERVICES DIVISION
CGA COMPUTER, INC.
212 West National Rd., Vandalia, OH 45377

DATA BASE ADMINISTRATOR

America's most respected legal publisher is seeking a Data Base Administrator, for its Rochester, New York headquarters. This new position offers an exciting challenge for an individual to formulate and implement policies and procedures to protect and enrich the utility of our legal product information resources.

Those applying should have at least 5 years experience in logical and physical data base design with IDMS including a minimum of 2 years with principal responsibility for installing and maintaining IDMS data base system software; and 5 years of programming experience in at least 1 high level language.

The Company offers an excellent salary, a top benefits package, and liberal relocation expenses. Please send resume with salary history to:

Roger Roth, Personnel Manager
The Lawyers Co-operative Publishing Company
P.O. Box 23008
Rochester, NY 14692
An Equal Opportunity Employer M/F

PROGRAMMER/ANALYST

Northern California retail chain seeking individual with 2-3 years solid experience to work on S/38 and RPG III coding. Fully understanding data base and on-line applications design. Background in telecommunications would be a definite plus. Strong capability to supervise programming staff. The position offers top salary and benefits. Send resume to Programmers, P.O. Box 886, Benicia, CA 94510.

ANALYST INFORMATION CENTER TO MID-\$30's

Leading-edge manufacturer headquartered in Twin Cities seeks analyst with programming background to assume leadership in micro and mainframe areas: IBM 4341 w/90 - micros now; also MSA, CICS, IDMS, AMAPS, CULPRIT. New marketing and order-entry systems to be developed. Requires 3-5 yrs in DP including 1 yr C280L and BASIC. Call Mark David or Tim Smith at (612) 339-9001 on Job # 6725

ROBERT WOLF
OF KENNEDY & ASSOCIATES, INC.
3636 IDS Center
Minneapolis, MN 55402

D.P. Contractors

GET EXPERT TREATMENT

Fixed Price Work

Medical/medicine

- All Expenses Paid
- Top Rates
- New Development Work
- Desirable National Locations

the EXPERTS

11 River Street
Wellesley, MA 02181
(617) 237-1777

6911 Richmond Highway
Alexandria, VA 22306
(703) 765-8900

EXPERIENCED

SYSTEMS

PROGRAMMERS,

ANALYSTS AND

PROGRAMMER

ANALYSTS FOR

SUNBELT LOCATIONS

Job dissatisfaction, complacency, and frustration are the biggest obstacles to overcome to achieve one's career goals. Everyday new career opportunities pass us by because we are unaware of their existence. Let us keep you abreast of what your true value is in the market place. Absolutely no obligations, please call or write Keith Reichle, CPC, Data Processing Specialist.

Dunhill

OF CHARLOTTE, INC.
6401 Carmel Road, Suite 107
Charlotte, North Carolina 28226
800-438-2012
(NC Call)
(704) 542-0312

IMMEDIATE OPPORTUNITIES

IMMEDIATE OPPORTUNITIES CURRENTLY exist for skilled DP professionals with the following skills:

SYSTEM 38 - Requires RPG III experience. Salaries \$18-41K.

SYSTEMS PROGRAMMERS - MVS, VM, and DOS opportunities. Salaries \$26-54K.

DATABASE SPECIALISTS - IDMS, IMS, ADABAS, MODEL 204, and DMS 1100 designers, programmers and DBA's needed. Salaries \$26-50K.

UNIX/C - Software engineers and systems programmers. Salaries \$27-49K.

IBM PROGRAMMER ANALYSTS - COBOL and/or ALC opportunities for programmers and project leaders. Salaries \$22-37K.

Positions are available in Northeast, Sunbelt and West locations.

For more information call Tom Arnold collect at (301) 840-0460 or send resume to:

J. Randall Associates
P.O. Box 1521
Rockville, MD 20850
Attn: Tom Arnold

MIDWEST

The natural beauty of Northern Minnesota with an abundance of attractions for those who love hunting, fishing, boating, skiing, hiking and camping is home to these opportunities:

DATA BASE ADMINISTRATOR with 3-5 years exp. with DL1. Salary to \$40K.

SYSTEMS PROGRAMMER with 3-5 years exp. with DOS/VSE and VM. MVS is a plus. Salary to \$35K.

PROGRAMMER/ANALYST with 3-5 years exp. with business applications using COBOL. Salary to \$30K.

ROMAC

4548 IDS Center
Minneapolis, MN 55402
(612) 333-0126

ANALYSTS/PROGRAMMERS

GROWTH OPPORTUNITIES IN DP CONSULTING!

CRA is a firm of professional information systems consultants undergoing rapid expansion due to significant new client demand. We offer growth, challenge and variety in a flexible, stimulating environment to Programmers and Analysts with experience in one or more of these mainstream disciplines:

**MVS; IMS DB/DC; DOS/VSE;
CICS; DL-1; IDMS; COBOL.**

We look for people who place the same emphasis we do on excellence and results. In turn, we provide an open, participative style; local assignments; competitive salaries; and attractive benefits, including fully paid insurances, relocation assistance, stock participation and sabbatical leave.

CRA is located and operates in the Harrisburg, PA area, the State's capital. This Southcentral PA. region features a moderate climate, reasonable cost of living, excellent schools and a wide variety of recreational facilities.

If you qualify, call Ken Podd at (717) 737-4810, or write to:

CRA COMPUTER RESOURCE ASSOCIATES

1300 Market Street - Suite 3
Lemoyne, PA 17043

All replies will be treated in strictest confidence, and all replies will be answered.

If
you are looking
to recruit computer
professionals
your first step
should be
to advertise in
COMPUTERWORLD

Chances are,
it will be
the step needed!

We're the number ONE trade newspaper for the computer industry. It makes sense, then, that advertising in **Computerworld** should be the first and most logical step to take when searching for quality computer industry professionals.

With exposure to over half a million readers, there are bound to be plenty of people who are looking for what you have to offer. This means a greater number of responses to your advertisement and a wider selection of candidates from which to choose. And you shouldn't have to look any further.

Computerworld publishes every Monday with an ad deadline of 10 days prior to each issue date. You may send in copy to be pubset or camera-ready material (velox or negative) via the mail. We provide telecopier service and will also take simple ads over the phone.

Our mailing address is:

COMPUTERWORLD
Classified Advertising
375 Cochituate Road,
Box 880,
Framingham, MA 01701

Or call for more information at
1-800-343-6474

or,
in Massachusetts, (617) 879-0700

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

Computer Services; Director Of Computer Center

Responsible for academic and administrative services of computer center; supervising staff, planning, programming, and implementing a database management system and related software developments. Graduate degree in computer science or related field preferred. Bachelors degree with post graduate vendor training, formal course work, etc. considered. Management experience at the project/ team leader level or higher, with three years systems and/or applications programming experience, preferably in COBOL is required. Experience with design and development of database management systems is also required. IBM experience at the 4300 level or larger plus CICS/CMS is preferred. College/ university experience desirable. Salary is commensurate with qualifications and experience within range \$30,533 - \$41,232. Excellent fringe benefits. Write for position announcement or submit letter of intent, resume, unofficial transcripts and three letters of recommendation postmarked by February 18th, 1985 to Mr. Drew McGinnis, Chairperson, Recruitment Committee For CC Director, Mansfield University, Mansfield, PA 16933. AA/EEO - Mansfield University actively solicits the applications of blacks and other minorities.

Eastern Washington University has a full-time teaching position available in the Management Information Systems department effective September 1, 1985. Teaching assignment includes undergraduate and graduate courses in business statistics and/or computer concepts and management information systems. Applicants should have a doctorate or be at ABD stage, with appropriate professional experience. Individuals with a MBA degree, or Masters in Computer Science or MIS, are also encouraged to apply. Eastern has campuses in Spokane and in nearby Cheney, and its business programs are AACSB accredited. Applicant files will be reviewed beginning December, 1984. Vita should be directed to: Dr. Frank Nelson, Chairman, Department of Management Information Systems, School of Business, Eastern Washington University, Cheney, WA 99004. An Equal Opportunity Employer.

We're Hiring Data Processing Professionals

Central and South West is a two plus billion dollar electric utility holding company offering competitive salaries, excellent benefits and stable working conditions. Our Information Services Department, as host center, provides services in a multi-company environment.

Our primary system software is MVS/SPI with JES2. Additionally we use TSO/SPF, COBOL, ROSCOE, and Command Level CICS. Our data base is IDMS. We were recently chosen to be one of Cullinet's beta sites for their new development software! We use Cullinet's 4th generation languages—ADS/O, OLM, CULPRIT, etc.

Each of our current openings needs people with proven analytical skills and user interface experience in addition to technical knowledge and abilities.

If we're the type of company you are seeking, and your experience is from a similar environment, please send your resume and salary requirements to the Employee Relations Department. Principals only.

Programmer/Analyst (Business Applications)

Typical project assignments include construction project management, land management system, corporate shareholder system, etc. Will provide technical expertise in system design, problem determination and system maintenance efforts. Should have JCL skills and online experience (CICS, VSAM) plus exposure to data base concepts.

Sr. Programmer/Analyst (Engineering Applications)

Multi-project assignments offering multi-company exposure will include CAD/CA-I, VM/CMS, transmission design, etc. Will provide scientific/engineering expertise in system design and implementation efforts. Should have prior scientific/engineering application experience plus IDMS experience.

Programmer/Analyst (Engineering Applications)

Initial assignment to the mining information management project will result in the development of a total, stand-alone system using state-of-the-art technology. Will provide online and data base technical expertise in system design and problem determination efforts. Should have related technical skills developed from manufacturing related assignments. IDMS, ADS/O experience important.



Central and South West Corporation
P.O. Box 220164 • Dallas, Texas 75222

Central and South West Corporation is one of the nation's leading electric utility systems, having annual revenues of more than \$2 billion. With corporate headquarters in Dallas, CSW serves more than four million people through its operating companies in Texas, Oklahoma, Arkansas and Louisiana.

Equal Opportunity Employer

Nationwide AUTO PARTS LOW PRICE GOOD ADVICE

SENIOR SYSTEMS PROGRAMMER

Nationwide Incorporated, a leader in the retail automotive aftermarket with over 150 stores in eight states, has an immediate need for an experienced Senior Systems Programmer in our Data Processing Center located in Columbus, Ohio.

This position offers a challenging opportunity for an individual eager to grow with the company. Reporting to the Director of Data Processing, the successful candidate will install and maintain operating systems, monitor and tune systems performance, manage hardware/software resources, consult and train operations and applications personnel, and evaluate new hardware/software systems.

Qualifications must include a high level of expertise in the technical support of DOS/VSE, CICS, VSAM, and related products. VM, VTAM, Series/1 and 4341 experience is also desirable.

We offer a competitive starting salary, excellent benefits package, relocation assistance, and an opportunity for growth within a professional environment.

If you are interested in this position, please forward a detailed resume along with salary history to:

Peter Stein, Employment Manager
Nationwide Incorporated
2208 S. Hamilton Road
Columbus, Ohio 43232

An Equal Opportunity Employer M/F

SENIOR ANALYST/ PROGRAMMER

The Pennsylvania
State University
Library (LIAS)
Computer Operations Div.

The heart of Pennsylvania-Nittany Valley's Centre Region and Penn State's Library (LIAS) Computer Operations offers the best of all worlds, e.g., cultural events, a rural setting and a challenging work environment.

A senior level position is currently available—dynamic, creative, away-from-the-big-city opportunity—for qualified individuals to be involved in state-of-the-art software design and development of integrated information systems. Become a member of a modest-sized research and development team using dedicated computer facilities ranging from multi-processor, large scale computers (Honeywell, DPS8/C*) to personal computers (MS-DOS, CP-M, etc.).

Define and formulate statements of problems; devise solutions, preparing block diagrams and system specifications. Analyze system and program logic; recommend and make revisions. Verify program logic with test data, test and debug program. Prepare documentation to assist in training, operation and maintenance of the system.

Requires Bachelor's Degree (or equivalent) in Computer Science plus 3 to 4 years of effective experience in computer programming and analysis. Experience in analysis and development of library computer systems preferred. Microcomputer experience highly desirable.

Liberal fringe benefits, including educational privileges. Send an application letter, current resume and three letters of reference to: Employment Division, 117 Willard Building, Box CW-100, University Park, PA 16802. Please state salary requirements. Application deadline: January 14, 1985. An Equal Opportunity / Affirmative Action Employer.



"I told
Mr. Bigelow
I could find
the right
person for
the right job,
right now."

Wrong.

It's easy to tell the boss you can fill any job opening when the time comes. But what happens when the time comes? How do you go about finding just the right person for that key position, or worse yet, key positions? Before Bigelow starts asking questions?

We specialize in placements in computer technology, corporate accounting, public accounting, finance and banking. And our staff comes from these fields. Our national system has on file thousands of professional applicants. And we can help you find the right person for the right job, right now.

ROMAC

Call your local ROMAC® office to have a free "How-To-Hire-A-Key-Employee" brochure sent to you at no obligation, or call our corporate office, 800/541-0253 or 207/773-4387

Albany, NY 315/463-5644
Arlington, VA/D.C. 703/525-3180
Atlanta, GA 404/523-3535
Baltimore, MD 301/429-0450
Boston, MA 617/482-6816
Buffalo, NY 716/853-4303
Charlotte, NC 704/333-3866
Cleveland, OH 216/771-6822
Columbus, OH 614/223-7077
Dayton, OH 601/463-7100
Fairfield, CT 203/255-9145
Fl. Lauderdale, FL 305/755-0817
Hartford, CT 203/252-8037
Hingham, MA 617/523-0500
Hingham, RI 617/528-6327
Newton, MA 617/559-4100
Olathe, MO 303/643-0165
Palm Beach, FL 305/658-6880
Portland, ME 207/773-4749
Portsmouth, NH 603/431-2706
Richmond, VA 804/644-0766
Rochester, NY 716/223-4400
Syosset, NY 516/422-1331
Tampa, FL 813/228-6327
Worcester, MA 617/876-7530
Wilmington, DE 302/658-5657
Wilmington, NC 919/775-7831

POSITION ANNOUNCEMENTS

NEW ENGLAND

BOSTON SENIOR P/A-PL-1
Highly sophisticated computer svcs. firm seeks a tech astute PL-1 P/A. Environ. is IBM MVS/XA IMS/CICS. Oppty. to help develop next generation on-line DBMS order process. svs. \$33,000.

BOSTON EDP AUDITOR
Highly regarded Nat'l. mfg./dist. org. located on picturesque Mass. So. Shore seeks tech. talented audit pro. Will lead IBM OS, DBMS, MINI/MICRO environ. Exceptional benefits, vis. & adv. pot. Salary to \$32,000.

BOSTON VAX P/A
Growing BOSTON area sub. of nat'l. svcs. firm seeks sharp VAX/VMS COBOL P/A for new apps. develop. Leading edge technology incl. DBMS+ networking. Exceptional oppty. to learn & grow. Salary to \$28,000.

HARTFORD TECH SUPPORT
CT oppty. for sr. MVS "Internals" indiv. to assume corp. respon. for current/future installations. Excellent growth situation in state-of-the-art technology. Salary to \$40,000+.

HARTFORD SOFTWARE ANALYST
Fin'l. svcs. client seeks indiv. to provide hdw/sftw evaluation and CICS/DBMS tech planning support to new dev. apps. Very promotable oppty. into tech mgmt. Salary to \$38,000.

PROVIDENCE DATA CENTER MANAGER
Major consumer goods mfr. seeks Sr. Sys. pro to manage opns., tech support & quality assurance. IBM mainframe (DOS to OS conversion) bkgd. desired. Rpts. to MIS Dir. \$43,000.

University of Houston-Victoria Faculty Positions
University of Houston-Victoria is an upper-level component of the University of Houston System offering courses leading to baccalaureate and master's degrees in Arts and Sciences, Business Administration and Education. Located 120 miles southwest of Houston, UH-V serves a 15-county area and cooperates with three area community colleges. Applications are invited for the following positions beginning Fall, 1985:
Computer/Information Sciences Positions
Assistant Professor, tenure-track positions (2). Minimum requirements: Master's Degree in Computer Science. Salary competitive.
Preference given to applicants with experience in program development, teaching experience, research, and doctorate coursework.
Computer facilities on campus include a VAX 11/780, a Honeywell 6/47, remote processing to a Honeywell 66/60, and microcomputer laboratory.
Application deadline: February 15, 1985. Send nomination or letter of application, resume, list of graduate coursework, courses taught, and list of three references to: Dr. Ronald G. Walker, Dean, Division of Arts and Sciences, University of Houston-Victoria, 2302-C Red River, Victoria, TX 77901. An Affirmative Action, Equal Opportunity Employer.

TELECOMMUNICATIONS MANAGER
University of California, San Diego
Technical Mgr. for multi-faceted organization (program development, operations, mgmt support) to coordinate conversion of 5,000+ voice lines to 4th generation digital switch & establish operation of 60,000 ft local area network for data. Manage automated operations division including security & video, satellite & radio services, microwave network. Perform complex cost feasibility studies. Requires strong related technical & administrative leadership, communication & mgmt skills. Salary range: \$35,364-\$46,980/yr. Apply by 1/14/85 to UCSD, SPO, 501 Wrenn Campus, G-016 (Job #9278-K), La Jolla, CA 92093. AA/EEOE.

Manager Technical Administrative Group NU Computing Services
Seek person to direct the activities of the Technical Administrative Support Group and provide adequate, reliable and up-to-date technical support tools for the University of Nebraska Administrative Application Systems. Will evaluate, recommend and coordinate with vendors, faculty, personnel and users, the implementation of new software and/or hardware to meet the needs of administrative applications systems and NU data administration.
Requires Bachelor's degree minimum in Computer Science or related field plus six years experience in systems design and analysis. Should have three to five years managerial experience in technical data processing environment. Should be knowledgeable in COBOL and IBM Assembler languages. Apply by January 18 to Mr. Nancy Box, Search Chair, 225 Nebraska Hall, University of Nebraska, Lincoln, Nebraska 68588-0521.
Affirmative Action
Equal Opportunity Employer

ROBERT HALF

EDP PERSONNEL SPECIALISTS
Contact the Manager of any office listed below.

100 Summer St., Boston, MA 02110
(617) 423-1200

111 Pearl St., Hartford, CT 06103
(203) 278-7170

900 Turks Head Bldg., Providence, RI 02903
(401) 274-8700

Client Companies Assume All Fees.

ATTENTION DATA BASE PROFESSIONALS CHOOSING IS NOT EASY

With your valuable experience, you can afford to be selective when choosing a prospective employer.

Take a look at us!

We are the Arbitron Ratings Company, a leader in the television and radio audience measurement field.

An outstanding opportunity exists for a DATA BASE CONSULTANT to join our Management Information Systems staff.

To be considered, you must have the following:

- A four year college degree
- Minimum of eight years of experience and proficiency with current Data Base Design and Applications
- Data Base Implementation experience
- In-depth knowledge of at least one DBMS
- Experience with CYBER NOS a plus.

We offer an exciting, fast paced environment, excellent salary, a complete benefits package and an opportunity to grow. This challenging position is located in Laurel, Maryland, a convenient drive from Baltimore or Washington, D.C.

IF YOU'VE GOT WHAT WE WANT, WE WANT YOU!

Send resume in confidence to S. C. Bardos, Personnel.

ARBITRON RATINGS COMPANY
A Control Data Company
4320 Ammendale Road
Beltsville, MD 20705
An affirmative action employer

DIRECTOR OF COMPUTER SERVICES
Indiana University at South Bend

Directs the management and operation of computer services department. Manages personnel, budget and equipment. Coordinates campus computer operations with those of the IU network. Chairs campus computer committee and shares responsibility for planning with committee. Qualifications: masters degree (preferably in computer science or related area) or equivalent experience required. Knowledge and experience in application of computers to academic programs and administrative operations. Experience in software system and MIS required. On site equipment includes a Prime 750; network access to IBM Series 4300, CDC 855, DEC System 20, VAX and local microcomputers. Appointment on a 12 month basis beginning on or about July 1, 1985. Salary range \$27-35,000. Medical, dental, life and liberal TIAA/CREF available. Send resume and names of three references to Dr. Greg Baur, Chair of Search Committee, Care of Dean of Faculties Office, Indiana University at South Bend, P.O. Box 7111, South Bend, IN 46634. Applications accepted through February 1, 1985 or until position is filled.

Indiana University at South Bend
is an affirmative action/equal opportunity employer

OPERATIONS COORDINATOR ATLANTA GA

Strong HP 3000 exp. good tech. & people skills, and min 2-yr degree needed for immediate opening with Southern Baptist Convention agency. SBC background is job-related qualification.

Send resume:
Employment Services
Home Mission Board, SBC
1350 Spring St. NW
Atlanta, GA 30367

SUPPORT SPECIALIST
Provides consulting services in software selection and usage, systems design, programming, training and support to end-users at all levels and to Systems Development staff. Bachelors Degree in Computer Science plus four years experience in Electronic Data Processing. Must have knowledge of system development process and a formal methodology. Must have in-depth knowledge of the following products: DOS/VSE JCL, System Manager JCL & Utilities, Power JECL, VM CMS, COBOL, VSAM, DLI, SAS, Easytrieve/IMS, Panvalet, Panexec, Panaudit, REXX, Exec Exec 2. Knowledge of CICS Command Level, Assembler IBM Financial Information Systems Basic is preferred. Applicants not having the degree may substitute related professional experience on a year for year basis. Salary \$30,000 annum per 35 hour 5 day week. Send resume to: **Ellie Mattner, Personnel Department, University Of Medicine And Dentistry Of New Jersey, 100 Bergen Street, Newark, New Jersey 07103**

\$30 - \$35 Per Hour
Software Engineers/Military

- Programmers for C2 project. Intel, RMX, PL-M. Texas locations.
- Systems Programmers with M68000, Pascal or other structured language. Indiana location.
- Software message store and forward switch consultant for a military switch. Experience with ACP-127. New York based, light travel to Europe.

Start dates in January, applicants must have military systems familiarity.

Call or send resume to:
Computerware, Inc.
12901 Nicholson Rd. #200
Dallas, TX 75234
(214) 820-2091

GREAT JOBS!
U.S. or OVERSEAS

Banking, HOGAN	40-60K
Business P/A's	24-45K
EDP Auditors	25-50K
Data Base/Comm	30-75K
Insurance P/A's	25-60K
Manufacturing	35-50K
Scientific P/A's	To 50K
Systems Prgms	To 70K
Technical Design	To 90K
UNIX-All levels	28-40K

Send resume or call
THE LESLIE CORPORATION
4151 SW FRY, Suite 450
Houston, Texas 77027
(713) 960-9102

CLASSIFIED ADVERTISING ORDER FORM

Computerworld's Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Turnkey Systems and Real Estate).

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines.

Cost: Our rates are *\$144.90 per column inch. (A column is 1 13/16" wide.) Minimum size is two column inches (1 13/16" wide by 2" deep) and costs *\$289.80 per insertion. Extra space is available in half-inch increments and costs *\$72.45. Box numbers are *\$15.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE, or a Purchase Order Number..

Ad size desired: _____

_____ columns wide by _____ inches deep.

Issue Date(s): _____

Section: _____

Signature: _____

Name: _____

Company: _____

Title: _____

Address: _____

Telephone: _____

Send this form to:

COMPUTERWORLD
CLASSIFIED ADVERTISING,
375 Cochituate Road,
Box 880,
Framingham, MA 01701

Telecopier service is available.

Call:

800-343-6474
or
617-879-0700

extension 410 or 451

* All prices reflect 1985 increase.

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

EDP Instructors/ Course Developers

NCR is a \$3.7 billion computer company that places great emphasis on the development of effective training programs. High performance systems put a premium on course content and instruction.

This makes NCR Engineering and Manufacturing in Columbia, South Carolina a special place for gifted trainers. The spectrum of advanced generation, leading edge products we've created includes a very powerful UNIX* based microcomputer called the Tower. You'll be joining one of NCR's most prestigious and highly motivated engineering organizations.

Your responsibilities will include developing courses, and instructing computer professionals in a broad range of topics related to The Tower and other state-of-the-art computer systems. Content will include programming languages, UNIX operating system, data communications, and various other design/development topics. Courses will be continually changing to keep up with new system developments.

If you have a BS/MS in CS or EE, and have demonstrated ability to teach in a technical environment, we offer recognition and advancement factors you should investigate without delay.

Please send confidential resume with salary history to: Mr. Gordon Davidson, Dept. N56, NCR Corporation, 3325 Platt Springs Road, West Columbia, South Carolina 29169.

NCR

1884-1984
Celebrating the future

An equal opportunity employer
* Trademark of AT&T Bell Laboratories

SENIOR TECHNICAL CONSULTANTS

Cincom Systems, Inc. is a recognized, worldwide leader in data base/data communication and application software technology. Opportunities are available for results-oriented individuals to provide support and consulting on an international data base and teleprocessing network system. Experience is required in one or more of the following areas:

- IBM, Assembler, COBOL (Pascal is a plus)
- IBM Data Base and Teleprocessing experience
- TIS, TOTAL, E/I or CICS
- 4th Generation Language experience
- Demonstrated systems analysis and design skills
- Good oral and written communication skills

These technical consulting positions are available in Eastern and Midwestern locations throughout the United States.

Cincom Systems, Inc. offers a competitive salary, excellent benefit package and tremendous growth potential.

If interested, please forward your resume to:

Gary Hiles
Cincom Systems, Inc.
2300 Montana Avenue
Cincinnati, OH 45211

Cincom Systems

An Equal Opportunity Employer

Give us your resume

We'll give YOU Silicon Valley!

You've heard about the legendary companies here, if you've thought of joining one of them, let us help you make the connection. We've been here since the legends started, and know the right people in the right places.

There's a special need right now for technically qualified professionals in MIS and in marketing and sales in the computer vendor field. One of these positions could lead to the start of your own legend. Send your resume today, or call. All fees, interview, and relocation expenses are paid by our clients.

Computer Resources Group, Inc., agency
3080 Olcott St., Santa Clara, CA 95051, (408) 727-1656; or
303 Sacramento St., San Francisco, CA 94111, (415) 398-3535

CRG

AFFILIATES IN 27
MAJOR U.S. CITIES

An employer-retained professional placement service

PROJECT LEADER: COMPUTER SYSTEMS DEVELOPMENT



SOHIO RESEARCH & DEVELOPMENT

The Standard Oil Company (Ohio) is a diversified energy, minerals and manufacturing company with worldwide headquarters in Cleveland, Ohio.

As Leader, Business Units Projects in the Computer, Control and Information Sciences Laboratory, you will:

- Investigate new applications and opportunities among SOHIO's business units.
- Direct development and implementation of projects for these businesses.
- Participate in long term developments of computer technologies for SOHIO's businesses and transfer these technologies to the businesses.



Beautiful 75-acre campus facility in a suburb east of Cleveland

You must have strong systems analysis experience, preferably with VAX/VMS, UNIX** or scientific systems, using FORTRAN or C. Excellent interpersonal skills are required.

Combining computer systems R&D with direct application of advanced technology may be one of the most exciting and stimulating opportunities available today. We urge you to investigate it promptly!

Attractive total compensation plans include comprehensive benefits. SOHIO's relocation package for new hires includes all normal moving expenses. Homeowners also qualify for mortgage interest differential allowance, third party home purchase and other features typically restricted to internal transfers.

Send resume to:

Ms. Sarah Steiner, Senior Executive Recruiter

THE STANDARD OIL COMPANY (Ohio)

1424 Midland Building - 707CW - Cleveland, Ohio 44115

An Equal Opportunity Employer
NO THIRD PARTY INQUIRIES, PLEASE

"Help us Help to Assure America's Energy Future"

UNIX is a trademark of Bell Laboratories.

SOHIO

ANALYST/ PROG/ I.C./COMM.

Our Fortune 500 high tech R&D mfg. client in the NY Southern Tier area has new data center. Exciting opp'ty's now exist for IBM/Honeywell trained prog. programmers, analysts, data communications, sys. (MVS-VM) programmers, data base admin. & info. center analyst/mgr. Hiring to happen before year end! Beautiful community with extraordinary quality of life. To \$43,000.

ROBERT HALF OF BUFFALO, INC.
420 Main Street
1310 Liberty Building
Buffalo, NY 14202
(716) 842-0801
Personnel Agency

Eastern Washington University has a one-year teaching position available in the Management Information Systems department for the 1985-1986 academic year. Teaching duties will consist of undergraduate courses in Administrative Office Management and Business Communications. Applicants must have a masters degree with emphasis in Administrative Office Management, Record Systems and Business Communications, or a doctorate/ABD in the Administrative Office Management area. Eastern has campuses in Spokane and in nearby Cheney, and its business programs are AACSB accredited. Applications will be reviewed beginning December 1984. Visa should be directed to: Dr. Frank Nelson, Chairman, Department of Management Information Systems, School of Business, Eastern Washington University, Cheney, WA 99004. An equal Opportunity Employer.

VM SOFTWARE DEVELOPERS

Goal Systems is a profitable and growing system software development and marketing firm located in Columbus, Ohio. We maintain continuous job openings for exceptionally creative and experienced people to add major extensions to our existing software products and to design new products.

Minimum qualifications include:

- Expertise in IBM/370 Assembler
- Internals level knowledge of VM
- Ability to define, evaluate, implement, and test system designs, strategies, and alternatives
- Design and development experience on some major system

We offer competitive starting salaries, outstanding company-funded profit sharing and benefit programs, and the opportunity for software developers to participate in the success of their products.

To take advantage of this unique opportunity, please send resume, including salary history, or call:

Kathleen Cauley, Human Resources Manager.

GOAL SYSTEMS INTERNATIONAL

5455 N. High Street • Columbus, Ohio 43214
1-800-848-4640

Goal Systems

Software Solutions

An Equal Opportunity Employer.

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

Where
The Brightest
Minds Supply The Light

It takes bright minds to utilize advanced IBM computers as the nerve center of our Energy Management System. It takes vision to pursue solar research since 1954. It takes excellence in design and build the world's most advanced nuclear power plant. Arizona Public Service Company has achieved all this and more.

We pioneered the installation and refining of scrubber pollution control on our coal-fired generating units. We've built one of the world's largest solar photovoltaic generation systems at Phoenix Sky Harbor Airport. We're continually researching new sources of energy, initiating sophisticated computer applications, and developing innovative conservation-oriented marketing concepts.

Our brightest minds come in several categories. They are:

PROGRAMMER ANALYSTS
Must possess IBM work experience. COBOL and PL/I plus a willingness to learn higher level languages such as Mark IV and SAS necessary in some positions. A SO/SPR preferred. Knowledge of PERT/CPM, PREMIS/PCOM helpful in some departments.

PROCESS CONTROL ENGINEERS
Must have proven technical experience on corporate (IBM Mainframe) and process control systems (Honeywell 4500) to provide engineering and operations assistance and enhance support, maintenance and enhancement of existing systems.

SYSTEMS ENGINEERS
Must have experience in IBM (IBM compatible) hardware and systems configuration. Experience in network-ing user equipment into an IBM network based on a large mainframe is desirable.

Our people stay with us because we challenge them, reward them, provide career direction, listen, assist and offer an open communications line to management. The light we supply is a reflection of the light you bring us. To be considered for employment at one of the finest and most advanced service companies in the U.S., send resumes to: **David Bentler, ARIZONA PUBLIC SERVICE COMPANY, Dept. CWO1217, P.O. Box 21866, Phoenix, AZ 85036.**

An Equal Opportunity Employer M/F/H

APS.
Arizona Public Service Company
Nothing Less
Than The Best

MEMPHIS

Welcomes you. We specialize in the placement of data processing professionals and have done so for nearly 20 years. If you qualify for a position commanding a salary range over \$25,000, please contact us. Each applicant receives the utmost of confidentiality. Our clients pay our fees and provide relocation assistance.

B. ROMAC
One Commerce Sq., Ste 2550
Memphis, TN 38103
901-523-0500

Eastern Washington University has two full-time positions available in the Management Information Systems department effective September 1, 1985. Teaching assignment includes undergraduate and graduate courses in management information systems and/or micro-computer business systems. Applicants should have a doctorate or be at ABD stage. Persons with a MBA or Masters in MIS or Computer Science plus appropriate business experience, will also be considered. Eastern has campuses in Spokane and in nearby Cheney, and its business programs are AACSB accredited. Applicant files will be reviewed beginning December, 1984. Visa should be directed to: Dr. Frank Nelson, Chairman, Department of Management Information Systems, School of Business, Eastern Washington University, Cheney, WA 99004. An equal opportunity employer.

Visiting San Francisco?

Let us know when you are arriving and we may arrange that you stay forever!

If you are an experienced Data Processing Professional with skills in Large Systems or Main Data Base or On-Line Systems, consider a move to the beautiful San Francisco Bay Area.

LOGICAL OPTIONS
Incorporated Agency Est. 1975
One Market Plaza, Spear Tower, Suite #2014A
San Francisco, CA 94105 • (415) 777-3900

If you are a college graduate and have experience in COBOL, the University of Texas at El Paso has the following openings:
PROGRAMMER ANALYST II - able to work in an on line data base environment using CICS, OS/MVS, and CMS. Salary \$18,588 - \$24,288 annually.
PROGRAMMER ANALYST IV - able to work in IBM 4341, OS/MVS, VSAM, CICS, Data Base, and Structured Methodologies in system design and analysis. Responsibilities include analysis, design implementation, planning, training, programming supervisory, verification of program logic, creation of formal documentation. Salary \$24,288 - \$31,752 annually.
For immediate consideration, mail your resume and salary history to Personnel Office, U.T. El Paso, El Paso, Texas 79968-0507. Closing date for applications is 1-31-85. The university is an EEO/AA employer.

SYSTEMS ANALYST

Salary: \$2,887 - 3,278 per mo. + excellent benefits, including 2.5% retirement contribution paid by City.
Inglewood, Ca. (Pop. 97,000) is seeking a highly experienced person to design, develop, and implement major computer based management and financial systems. Knowledge of ACSI 74 COBOL, IBM CICS or Sperry IMS/VS; a four year degree with major coursework in Finance, Computer Science, Engineering or related field; six (6) years data processing experience, including two (2) years as a Systems Analyst; and experience with IBM style (MS-DOS) Personal Computers are required. Municipal government background is highly desirable. Submit resume to: City of Inglewood, Personnel Department, One Manchester Blvd., Inglewood, Calif. 90301; (213) 412-5460.
A Fair and Equitable Employer

COMPUTERWORLD CLASSIFIEDS-- --PROGRAMMED TO HELP YOU

The computer industry is dedicated to developing greater efficiency and valuable time-saving resources for the business world.

Well, so are **Computerworld Classifieds**.

And we can deal with a lot of problems. Our classifications include:

Position Announcements - To help you find the computer professionals right for you.

Positions Wanted - For individuals seeking full-time, permanent positions - no company ads are allowed.

Buy, Sell, Swap - For those seeking to buy, sell or lease computer equipment.

Time & Services - For companies who want to offer computer timesharing or other computer-related services.

Software For Sale & Software Wanted - Used for buying & selling software packages.

Business Opportunities - For those seeking individuals or partners in computer-related business ventures, mergers, or franchises.

Real Estate - For those seeking to sell or lease office space suitable for computer rooms or computerized businesses.

Bids & Proposals - Used to request for bids on equipment or to invite proposals for desired computer acquisitions.

Here's the data you need to know to place your ad:

The deadline for classified advertising is ten days prior to the issue desired. (That's six working days prior to the issue date). Ads may be sent in by mail. For camera-ready ads, a velox or negative is required. For ads to be typeset by us, enclose a layout if needed, along with any logos or artwork you would like to include in the ad. These must be dark and clear for reproduction purposes.

Our ad takers will be happy to take smaller sized ads over the phone. We can provide simple line borders for you, if desired.

We also provide telecopier service at extensions 410 and 451.

The open line rate is \$10.35 per line and there is a minimum size ad of 2 column inches (28 lines) at a cost of \$289.80. Column inches are calculated by multiplying the number of columns wide by the number of inches deep that your ad is. Depth increases in half-inch increments and we accommodate up to 5 columns. Column widths are as follows:

1 column --	1 13/16" or 11 picas
2 columns --	3 13/16" or 23 picas
3 columns --	5 13/16" or 35 picas
4 columns --	7 13/16" or 47 picas
5 columns --	9 13/16" or 59 picas

If you wish a box number to be assigned to your ad, it will cost an additional \$15.00.

First-time advertisers must send either payment or a purchase order along with their ad.

So, whatever the problem, simply supply us with the data we need to help you on your way to a solution, quickly and efficiently.

If you wish to reserve space, or would like more information, call us at 1-800-343-6474 or (in Mass.) 617-879-0700. All materials should be sent to:

COMPUTERWORLD Classifieds
Box 880, Framingham, MA 01701

* All prices reflect the 1985 price increase.

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

Work in the

GREAT SOUTHWEST

Pima County, Arizona — located in one of America's fastest growing metropolitan areas, Tucson — has openings in its Data Processing Department for

SYSTEMS
SOFTWARE SPECIALIST

\$25,356 - \$28,650

Climate:

Average maximum temperature	81.5
Average minimum temperature	54.1
Average rainfall	11 inches
Average % sunshine	86%

Education:

University of Arizona, Pima Community College, largest elementary and secondary school system in Arizona, Fifteen public libraries.

Recreation:

112 parks
Snow skiing resort less than one hour drive for Tucson
20 golf courses
70 miles from Old Mexico
Fishing and water skiing lakes in all directions from Tucson

Pima County is looking for progressive, innovative people who enjoy challenging careers.

THE IDEAL CANDIDATE will have a Bachelor's degree in Computer Sciences and four years of experience in systems programming in Assembly Language, including two years installing and maintaining OS/VS1 and CICS.

Resumes and applications for EDP Technical Support Specialist (1451) will be accepted until vacancies are filled. Submit to:

Pima County Personnel Department
4th Floor Health and Welfare Building
151 W. Congress St.
Tucson, AZ 85701
(602) 792-8176

Principals Only.

COMPUTER SECURITY SPECIALIST

MCDONNELL DOUGLAS

McDonnell Douglas Corporation has an immediate opening in St. Louis, Missouri for a Computer Security Specialist interested in career advancement. Candidate should have a BA degree in Computer Science or related field and knowledge of DoD security regulations. Above average oral and written communications skills required. Responsibilities would include administration of 35 major classified processing systems, design of new facilities, and application of TEMPEST standards and cryptographic techniques. Candidate should be eligible for a Top Secret clearance. Position offers competitive salary and outstanding fringe benefit package including stock savings plan. Send resume and salary requirements to:

Manager, Professional Staffing
MCDONNELL DOUGLAS CORPORATION
P.O. Box 516
Dept. 62-352-53
St. Louis, MO 63166

An Equal Opportunity Employer • U.S. Citizenship Required

MCDONNELL DOUGLAS

CORPORATION

NEW YORK

COBOL OPPTYS GALORE!
-- \$20 - \$45,000 --

SR. P/A IMS, Logical Design	SR. P/A Systems 38
DP MANAGER WANG VS 80 Health & Beauty bkgd a must	P/A HP 3000 Order/Sales Analysis
P/A DOS/SE, Acctg Applications	P/A OS, IBM 3081 a must
P/A OS, IBM 3033, CICS, VSAM	SR. P/A OS, Insurance Brokerage

ROBERT HALF
OF NEW YORK, INC.

522 Fifth Avenue
New York, New York 10036
(212) 221-6500

Client Companies Assume All Fees

DIRECTOR,
INFORMATION SYSTEMS
MINNESOTA COURTS

Responsible for the planning, development, implementation and operation of court information systems (case record-keeping and state and local case flow management) in Minnesota appellate and trial courts in a distributed processing environment. Supervision of staff of 30 consisting of managers, systems analysts, programmers, training and data entry personnel.

QUALIFICATIONS REQUIRED:

- Relevant baccalaureate degree
- 7 years information systems experience, at least three of which include supervising systems professionals.
- experience in general systems management including systems analysis and development and project management and methodology.
- solid knowledge of the technology including data base administration, teleprocessing and data communications, and DP center management.

SALARY RANGE: \$42,200 to \$55,000.
SUBMIT RESUME BY JANUARY 4, 1985 to:

Director of Personnel
40 North Milton, #300
St. Paul, MN 55104
Ph: (612) 296-6822

Equal Opportunity Employer

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN
SENIOR
RESEARCH ENGINEER
DATA
COMMUNICATIONS NETWORK

The College of Engineering at UIUC requires a Senior Research Engineer to define, implement, and control the installation of an innovative computer network; supervise its maintenance and expansion; and ensure its operation. The network will involve 500 professional workstations, 500 pc's, 32 minicomputers, and several mainframes and will be integrated into campus-wide facilities. This is a non-tenured academic/professional position.

Applicants should have the management experience in data communications and networking to be able to assume full responsibility for the network. Requirements: Baccalaureate in a computer-related area and experience in data communications. Experience with UNIX is highly desirable. Starting salary: \$30,000/year and up as a function of experience. Anticipated starting date: April 1985. For full consideration, applications must be received by Feb. 15, 1985. Apply to: Professor A. L. Addy, 144 Mechanical Engineering Building, 1206 W. Green Street, Urbana, IL 61801; (217) 333-1126.

The University of Illinois is an Affirmative Action/Equal Opportunity Employer

DIRECTOR, COMPUTER
APPLICATIONS PROGRAMS

We are a major national organization and the leader in our field with headquarters in Chicago. We are searching for a highly motivated individual with 5-10 years experience as a manager of an applications programming development and support group.

This position has responsibilities both on a local and national level for a variety of applications programs, from business systems to communications network systems.

Specific qualifications would include:

- A Bachelor's degree in computer systems, or in-depth equivalent experience directing a group of some 25 professionals.
- Experience in both IBM and Burroughs environments desired.
- CICS and IMS applications systems experience required.
- Ability to manage multiple projects and to make difficult management decisions.

As a key member of our management team, you will report directly to the officer in charge of business operational strategy for this national organization operating in 50 states.

For confidential consideration, forward your resume and salary history to:

CW-B4108
Computerworld, Box 880
Framingham, MA 01701

Equal Opportunity Employer M/F

FOR ACHIEVERS ONLY

INTERMEDIATE to SENIOR LEVELS

- | | |
|-----------------------------|------------------------------|
| • Software Development Mgr. | • Microprocessor Software |
| • Technical MVS Specialist | • Systems & Programming Mgr. |
| • Data Base Administration | • EDP Audit/Security |
| • Voice/Data Communications | • Systems Planning |
| • Office Automation | • Manufacturing Systems |
| • LANS C Unix | • PC Micros |

BRUCE A. MONTVILLE
Managing Partner

EXETER 2100™

National Recruiting Consultants
(603) 926-6712

TOLL FREE
1 (800) 258-7328

COMPUTER PARK, P.O. BOX 4979
HAMPTON, NH 03842

System Developers
800-231-5920

Inviting resumes from individuals in the more highly technical computer related vocations such as: PhD Computer Scientists, Operating System Developers, Data Base Developers, Porting Specialists, Networks and Telecommunications, Architecture, Artificial Intelligence, Graphics Systems Developers, Microcoders and Firmware Developers, Compiler Development, etc. Special interest in emerging technology such as novel architecture, UNIX, ADA, etc. Similar interest in scientific applications developers including military, process control, data acquisition, telemetry and communications, CAD/CAM, simulation and modeling, etc.—we are a professional employment firm managed by graduate engineers. Fees are paid by the employer. All geographic locations. Send resume or call D.A. Redwine and ask for our free resume workbook & career planner.



Scientific Placement, Inc.

P.O. Box 19949 CW Houston, TX 77224 713/466-6100

© 1984 Scientific Placement, Inc.

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

SYSTEM 38 PROFESSIONALS

Location - Pittsburgh

Technical

- TELECOMMUNICATION SPECIALISTS
- SYSTEMS PROGRAMMERS

Develop and implement an extensive telecommunications network in a distributed processing environment with system 38's. Communicating in (SNA/SDLC) and (BSC) protocols over switched and non-switched lines using a variety of transmission speeds to a broad range of devices. Provide a full range of support to the interactive/batch environments for applications development concurrent with normal production activities. Develop APPC programs for a peer relationship between multiple system 38's. Use performance measurement tools to identify potential operating improvements. The candidates for the above position will have a minimum of two years' experience on System 38 utilizing RPG II or III, IBM Series/1, Audio Response, and/or IBM PC experience a plus.

Applications

- SENIOR PROGRAMMER ANALYSTS
- PROGRAMMER ANALYSTS

Senior candidates will have systems design experience and 3-5 years of programming experience. Good communications skills are required because of the extensive user interaction that will take place while designing many new systems. No old systems currently exist that need to be interfaced to, enhanced, or maintained. A working knowledge of RPG III, Basic, or COBOL is required. System 38/36/34, or System/3 experience is a plus. We are seeking ambitious, self-starters who have a desire to use their developmental skills in multiple System 38's environment.

We are a new Pittsburgh based subsidiary of a billion dollar service corporation, the leader in our industry. This is a unique opportunity to get in on the start up of a high growth operation. We offer an excellent compensation and benefits program. Qualified candidates should send their resume and salary history, in confidence, to:

CW-B4092
Computerworld, Box 880
Framingham, MA 01701

An Equal Opportunity/Affirmative Action Employer

GROUND FLOOR OPPORTUNITIES

TRACOR is forming a team to design, develop and install a fully automated radio telephone service. You will work at our Rockville facility using DEC VAX 11/780 and MICROVAX. We are seeking the following initial team members:

Sr. Computer Systems Analyst

- BSCS/BSEE/BS math required; prefer MSCS/MSEE
- Software development team leader for automated radio telephone system
- Minimum 4 years experience in design and coding of real-time systems in a VAX/VMS environment
- Experienced with DECnet, FORTRAN, Pascal or "C" desired

Computer Systems Analyst

- BSCS/BSEE/BS-Math required; prefer MSCS/MSEE
- Design and coding of real-time software for automated radio telephone system
- Minimum of 2 years experience in design or coding of real-time systems in a VAX/VMS environment
- Experienced with DECnet, FORTRAN, Pascal or "C" desired

To arrange for an immediate interview, please call Jerry Horna at 301-279-4444 or 800-638-8512. If a call is not convenient at this time, please send your resume to: TRACOR, INC., Dept. E-137, 1601 Research Boulevard, Rockville, MD 20850. We are an Equal Opportunity Employer.

Tracor Applied Sciences

Where your contribution counts.

SYSTEMS ANALYST

We are seeking an active and experienced HMO or Medical Clinic Systems Analyst who is ready to move up to project leader. In our state-of-the-art suburban facility the successful candidate will define current and future medical services information processing requirements including hardware and software function capabilities, data relationship and design standards.

Requirements of the position include previous experience in an HMO or clinical setting with industry level experience in applications such as pharmacy, laboratory, radiology, patient scheduling, medical records, clinical on-line applications and staff scheduling. In addition, the applicant must be capable of working independently and as a team member. Will also be experienced in successfully presenting the design concepts to diverse groups of users and developers.

Starting salary to \$42 K plus an excellent benefits package and park like Mid-Atlantic setting make this an unusually attractive career consideration. Interested and qualified individuals are invited to send resume to:

Box # CW-B4106, Computerworld,
Box 880, Framingham, MA 01701

Equal Opportunity Employer m/f

Manager

WOSU Computer Center
WOSU Station of The Ohio State University is seeking a Manager - Computer Center to develop all software using an IBM System 38. This individual will modify existing programs, train users on system features, and manage the WOSU Computer Center. This individual will also be responsible for the acquisition, administration and maintenance of all hardware. Candidates must have a Bachelors Degree in Computer and Information Sciences or related field or an equivalent combination of education and experience. Extensive experience in programming and systems analysis, IBM system experience and programming experience with RPG language required, familiarity with Cobol preferred. Starting salary: \$27,240 - \$30,600. Candidates should apply by January 4th, 1985 to: Professional Employment Services, The Ohio State University, Lobby Area, 1900 Neil Avenue, Columbus, Ohio 43210.

An Equal Opportunity
Affirmative Action Employer

SYSTEM CONSULTANT, 37.5 hours per week, no overtime, 9 am to 5 pm, M-F, salary is \$3,353 per month. This employee will work as a computer systems consultant, specializing in the Four-Phase Series I/IV computer (with its associated software), and the VOS/4 operating system. This individual will support clients in the design, implementation, and use of computer systems using VOS/4 on the I/IV. In addition, the individual will identify the source of problems which may arise while clients are using their systems, including problems arising from hardware failures and solve those problems. This individual will also maintain non-standard operating systems for the company's clients on the I/IV. Applicant must have completed grade school, high school and have 5 years of college with a masters degree in computer science, as well as having 2 years experience in the job offered or 4 years experience in the related occupation of system programmer. Job is located in the northwest suburbs of Chicago, Illinois. Send resumes to the ILLINOIS JOB SERVICE, 910 South Michigan Avenue, Room 333-3rd Floor, Chicago, IL 60602. REFERENCE NUMBER 3189-J, AN EMPLOYER PAID AD.

Computer Systems Analyst/Programmer, City of Santa Ana, CA (Pop. 215,000); Salary \$24,277 - \$29,810 per month. City pays employee's contribution to retirement. No social security deduction. The incumbent will confer with operating departments to ascertain specific computer needs, define project scope, systems, application and function requirements. He/she will ascertain specific output requirements such as report format and degree of data summarization. Requires education and experience equivalent to B.A. degree with a specialization in computer science, public administration, business administration or related field including or supplemented by completion of coursework in system and subsystem development and design, and two years experience in system design for large mainframe business computers. Apply by January 4, 1985. Hunt/Benson Department currently utilizes the IBM 4341 system.

The qualified applicant will hold a degree in Computer Science and have management experience. Previous hospital experience is preferred. Excellent benefits and working conditions. For immediate consideration, rush confidential resume to:

DIRECTOR OF INFORMATION SYSTEMS

A progressive 300 bed acute care hospital located in the deep south has an excellent opportunity for a Director of Information Systems. This 22-employee department currently utilizes the IBM 4341 system.

The qualified applicant will hold a degree in Computer Science and have management experience. Previous hospital experience is preferred.

Excellent benefits and working conditions. For immediate consideration, rush confidential resume to:

Sunbelt
P.O. Box 18444
Jackson, MS 39238-0444

Come To Colorado! SYSTEMS ANALYST

Penrose Hospital in Colorado Springs seeks a Programmer/Analyst who has three years experience in hospital patient billing systems. "Medpac" background preferred. Strong design knowledge of on-line system design required, including COBOL, VM and IBM mainframe experience. Send resume to Dave Seyfert, HRD Dept., Penrose Hospitals, P.O. Box 7021, Colorado Springs, CO 80933. Equal Opportunity Employer.

New England, Westchester & NY Metropolitan Area

Permanent and/or Independent Consulting
INTL BANKING - FUNDS TRANSFER
ON-LINE BROKERAGE - CHECK PROG.
BAL43000, CICS, IMS, VAX-BASIC, BURROUGHS-DI, ALCO, COBOL, IBM CICS, MACRO & COMMAND, MICROS, HONEYWELL COBOL: Level 6, TPS-screen write: Level 8, DMIV, TP, MULTICS; IMS, DBase II, PL/I.
Openings at all levels in any of the above. Call Maggie Liptak, 212-307-0939 or submit resume to Interface Inc., 17 West 54 St, NY, NY 10019.

ARTIFICIAL INTELLIGENCE Pittsburgh, PA

A leader in the development of high performance, interactive knowledge-based systems and software tools for industrial and manufacturing applications, seeks experienced LISP programmers and analysts. We offer competitive salaries and excellent benefits. Please submit resume in confidence to:

C.O.P. Inc.
428 Forbes Avenue
Suite 412
Pittsburgh, PA 15219

DALLAS

VTAM/NCP INTERNALS... To \$45K
ALC... To \$32K
CICS/GAS IMS (No Coding)... To \$45K
HPS300/COBOL... To \$32K
IMS/CICS... To \$41K
LIFECOM... To \$38K
ADABAS... To \$35K
McCormick & Dodge... To \$39K

All Fees and Relocation Paid

ROBERT HALF
of Dallas, Inc.
Two Westpark East, Suite 110
Dallas, TX 75231
(214) 363-3300 (agency)

There's No Time For DOWNTIME!

So while the industry works on your system's problems, let us work on your business problems. Advertise in-

COMPUTERWORLD CLASSIFIEDS!

One insertion will let a potential audience of over a half a million readers know what you are looking for or have to offer. Whether you are looking to recruit computer professionals, want to buy, sell or lease equipment, have computer time or services to offer, or software packages to sell, etc., the Computerworld Classifieds will help you get a lot of exposure and get things done faster.

The open line rate is \$10.35 per line and there is a minimum size of 1 column by 2" at a cost of \$289.80. We can accommodate up to 5 columns and depth measurement increases by half inch increments.

Ads may be mailed in, cleanly typewritten, with a letter stating the size desired and the issue in which it is to be run. Our team of adtakers will take ads that require no artwork or borders over the phone. We also provide telecopier service.

Any borders, logos, or artwork should be sent in with your ad and must be dark and clear enough to be reproduced.

Computerworld publishes every Monday and our deadline for receiving ads is 10 days (or six working days) prior to the issue date desired.

First time advertisers must send payment along with their first ad.

Our mailing address is:

**Classified Advertising
Computerworld
Box 880
375 Cochituate Rd.
Framingham, MA 01701
(617) 879-0700
(800) 343-6474**

* All prices reflect 1985 increase

BUSINESS OPPORTUNITY

PERSONAL COMPUTER BUSINESS OPPORTUNITY

Up to 2,000 nationally recognized brand-name personal computers offered for brokerage at up to 50% off manufacturer's list price. Fully IBM compatible with 256K, 2 disk drives, monitor, BASIC and DOS.

Great name, great arrangements. Interested parties please reply to:

Box CW-B4107
Computerworld, P.O. Box 880
Framingham, MA 01701

EDUCATION

Data Processing Professionals

VSAM (DF/EP)
CICS (1.6)
IDMS/R
IMS/DL1

UNIQUE COURSES: HANDS-ON TRAINING

with 20 Terminals on our IBM 4341 with VM/CMS/CICS (1.6) IDMS/R Software Systems.

Write and test your own programme

UNLIMITED SUPERVISED LAB TIME to complete the assignments.

WRITE OR CALL 212-777-5040

ICCS
CORPORATE TRAINING CENTER
10 E. 21 ST., NYC 10010
International Computers & Communication Systems, Inc.

Your Strategic Career Choice

Does your career need a strategic boost? If so, you should consider Dartmouth's professional program in the design and management of information systems.

Our two-year Master's program is designed to equip tomorrow's information systems managers to play a leading role in the design and development of effective business solutions to business problems. We offer a blend of technological, management, and communication skills, and a record of career advancement.

Students in Dartmouth's CIS Program spend one term as interns in a variety of sponsoring organizations. On campus, they study the broad fundamentals of information systems, networks and distributed processing, current analysis and design methodologies, database management systems, communication and management skills crucial to effective planning and implementation, and the social, ethical, and organizational issues related to information systems. Case studies and guest lectures by practicing managers of information systems and professionals-in-residence are regularly featured.

If you have previous experience in the computing field but want to be equipped to assume more responsibility and leadership, why don't you consider joining us next year? For more information, write:



Program in Computer & Information Science
Dept. C., Nathan Smith Building
Hanover, NH 03755

Dartmouth College

Researching all your options
will show you that
your best source is
COMPUTERWORLD

BUY - SELL - SWAP

1-800-IBM-USED

IBM is a registered trademark of International Business Machines

The only number
you need to call for
your IBM computer
requirements.

ALL UPGRADES

TERMINALS
3178
3278
3274
3180
5251/91
PC/XT

DISK
3340
3350
3370
3375
3380

PRINTERS
3203
5224
5225
5256
3245
3262

LEASING
SHORT OR LONG TERM
NEW OR USED

4300
3033 308X
New or Used

SERIES 1
PRINTERS
FEATURES
New or Used
IBM & CDC
CPU's
ALL MODELS

SYSTEM 38
New or Used

SYSTEM 34/36

BUY SELL LEASE
IBM Maintenance Guaranteed. Equipment Configured to Your Requirements.

IF IBM MAKES IT, WE CAN SAVE YOU MONEY -
whether you buy, lease or rent from us.
We also need to buy your owned or rental credit
equipment. Call us for a quote.

Marshall Lewis & Assoc., Inc. MI
1421 E. Carnegie Ave., Bldg. H, Santa Ana, CA 92705
1-800-IBM-USED
In California (714) 472-0234

IBM UNIT RECORD EQUIPMENT

DISK PACKS—DATA MODULES—MAG. TAPE—DISKETTES



SALE OR LEASE

IBM UNIT RECORD MACHINES

026-029-082-083-084
085-087-088-129-514
519-548-557

NEW & USED

DISK PACKS—DATA MODULES
2316-3336(11)-3336(11)-3348(70)

MAG. TAPE-DISKETTES
Every Item Guaranteed

Highest Prices Paid for Used Packs & Modules

THOMAS COMPUTER CORPORATION

5633 W. Howard St.
800-621-3906

Chicago, IL 60648
(IL-312-647-0880)

WANTED IBM SYSTEM/34's

Our company is looking to BUY IBM SYSTEM 34's for already committed END USER accounts. We will therefore pay TOP DOLLAR in U.S. and will pay all freight and packing charges from your facility.

Please call JAMES
at 619-271-1411

IBM

3270

PRINTERS, TERMINALS
& CONTROLLERS

Please Call: 312 675-8000

Forsythe McArthur Associates, Inc.
7500 Frontage Road
Skokie, Illinois 60077

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

Check
us
outfor
DECand/or
DEC serviced compatibles

VAX 780, 750

11/73, 70, 44, 34, 23

All immediate & guaranteed.
Everything from 11/23 to VAX**DATAWARE
SYSTEMS LEASE
800-221-6318**30 Bay St. S.I., N.Y. 10301
(212) 447-4911 TELEX 429394
TWX 710588-6738

DEC is a registered trademark of Digital Corporation

SYSTEMS

4341 4331

38 36 34

32 3

BUY • SELL • LEASE

COMPUTER
BROKERS, INC.
2978 SHELBY ST.
MEMPHIS, TENNESSEE

SERIES 1

Call

TOLL-FREE

800-238-6405

901-372-2622

PERIPHERALS

3203 3370

327X 3411

3350 3420

computer systems/
graphics, inc.**STC
MEMOREX
CDC**TAPE • DISK • CRT
PRINTERS

We Trade Them All

Tom Lynn

913+ 492-1442

9825 Widmer
Lenexa, KS 66215

THE RANDOLPH STORY... SINCE 1965.



Randolph, the most innovative and the most financially stable computer lease-financing company of the 1980's, had its beginning in 1965, when Randolph Computer Corporation was formed to lease IBM's newly-announced S/360 computers.

The company's initial bankroll—over \$18.0 million—was a hefty sum back in 1965, although it would be considered only petty cash in respect to Randolph's current daily leasing activities. But it was a start—and a good one.

OFF AND RUNNING. Randolph quickly established a reputation for leadership in the computer leasing industry. Just four years later, in 1969, The Travelers Insurance Corporation acquired all outstanding Randolph common stock. The company continued to grow, to add new customers for S/360's and peripherals. By 1972 Randolph's portfolio included over \$180 million of computer hardware.

ENTER...THE BANK OF BOSTON.

Then, in late 1972, the Bank of Boston purchased Randolph's S/360 assets through a subsidiary, Firstbank Financial Corporation, to become the first bank in the United States to enter the business of leasing and financing computers. The Bank administers these assets through Randolph, which is still staffed essentially by the same team of professionals who have an average of 18 years experience in the computer leasing and data processing industries.

LEADING THE INDUSTRY. Today Randolph provides lease-financing for IBM systems—CPU's and peripherals. Our customers continue to benefit from the skills of the most seasoned management team in the industry. And Randolph's affiliation with Bank of Boston gives added assurance that they can continue to depend on the company's unique financial stability.

STABILITY YOU CAN BANK ON.

The Randolph name and distinctive logo headline all of Randolph's advertising and communications, reminders that the first team in computer leasing will continue to provide high-quality lease-financing for all of IBM's computers and related equipment... to live up to the terms and conditions of its agreements... provide upgrades... and fulfill all of its commitments.

537 Steamboat Road
Greenwich, Connecticut 06830
203-661-4200 • 800-243-5307

Randolph



THE FIRST NATIONAL BANK OF BOSTON
BANK OF BOSTON

A MEMBER OF COMPUTER DEALERS & LESSORS ASSOCIATION **RANDOLPH COMPUTER CORPORATION** A subsidiary of

DATA GENERAL

We Buy, Sell And Service

New And Surplus Systems and Peripherals

Call Or Write

Hanson Data Systems

(outside Mass. toll free)

(within Mass.)

1-800-225-9216

(617) 481-3901

P. O. Box 27, Southboro, MA 01772

SALE	LEASE	PURCHASE
DATA GENERAL		
Desk Top 1/4000 10, 20 & 30 MV4000, MV8000 II, MV10000 DIGICONE Portable MV/4000 2Mb Memory S280, C150 Systems Nova 41X, 312, 1200, 1220 8537 Expansion Chassis Micronova, 64Kb, 1/0 Eclipse Memory MV/4000 1 & 2 MB Memory ALMA-10, ULMA-5, SLMA-2, DCL200 AMI-8, ATI-16, IAC-8, IAC-16		D210/D211/D410/D460 CRTs D100/D200/D400/6053 CRTs TP2, LP2, TPI Printers Letter Quality Printers 6160 73Mb Disk System 6181 147Mb Disk System 6236 354Mb Disk System 6038 12.5/1.2 Mb Disk System 6239 592Mb Disk System 6021/6026/6125 Tape Systems 4354/65 6000 PPM Band Printer 4354 340 CPS Printer

AMES SCIENCES, INC.
301/228-8100

3725's AVAILABLE IMMEDIATELY!

Centron DPL has 3725's available for immediate delivery configured to your specifications. Talk with one of our communications specialists today.



**Centron
DPL
Company**

7480 West 78th Street
Minneapolis, MN 55435
612/944-9161

Toll-Free 1 800 532-7532

Leaders from the Front End Out.



BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

SERIES 1.NEW, USED, FEATURES, & CDC PERIPHERALS.
HARD TO FIND NEW PRODUCTS IN STOCK.**34, 36, 38.**S/36's UNDER IBM LIST.
72 HOUR UPGRADES, S/38 FEATURES.**4331/4341**TAPE, DISK, PRINTERS,
FLEXIBLE LEASE ALTERNATIVES.**5110, 5120, S/23.**

DISPLAY WRITERS IN STOCK NOW.

800/328-3884

IN MINNESOTA, CALL 612/339-3042

We do an exceptional
job—our clients do
repeat business.*X-ceptional!***XERXES COMPUTER SALES**1614 Harmon Place
Minneapolis, MN 55403**PRICE BUSTERS!**

S/36

Who

You



Gonna

Call?

CALL CARLYN!**800-828-4227**

in VA 703-642-1950

CARLYN

COMPUTER SYSTEMS

5105Q BACKLICK ROAD, ANNANDALE, VA 22003

**FORSYTHE
McARTHUR ASSOCIATES, INC.****NEW LEASE PROGRAM****3178, 3179, 3180**

2 Or 3 Year Term Low Monthly Rent

Customized Flexibility

Hdqtrs: Skokie, IL (312) 675-8000

Atlanta (404) 953-9457 Milwaukee (414) 785-9544

Detroit (313) 332-1272

MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 508 Robert E. Lee Building, Jackson, MS 39201 for the following data processing equipment a/d services:

Request for Proposal No. 969, due Tuesday, January 8, 1985, at 3:30 p.m., for the acquisition of IBM's Customer Information Control System or equivalent software package for ALCON STATE UNIVERSITY.**Request for Proposal No. 970**, due 3:30 p.m., Thursday, December 20, 1984 for the acquisition of components necessary to add 16 ports to an existing Atlantic Research Corporation Technical Control Center for the STATE COMPUTER CENTER.**Request for Proposal No. 971**, due 3:30 p.m., Thursday, January 3, 1985 for the acquisition of a COBOL program development package to run under AOS/VS/INFOS on two Data General MV/8000 systems at MISSISSIPPI STATE UNIVERSITY.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Dorothy Hooper or Elaine Knauss, State Central Data Processing Authority
601/259-1395*The nationwide market - a call away!***DEC/DG**SYSTEMS/PARTS/PERIPHERALS
NEW/USED/SURPLUS • DISCOUNT PRICES*Since 1977! Buy, Sell, Trade and Broker.***PHIL**

DG

BRYAN

11-VAX

JENNIFER

8-LSI

CALL TODAY - (305) 392-2005

TELEX 568-670

**thomas business systems, inc.**

© 4301 Oak Circle • Unit 11 • Boca Raton, Florida 33431

IBM
BUY-SELL-LEASE**SERIES-1****34 • 36 • 38 • 23****4300**

3705

3706

3725

Upgrades

Tubes • Printers • Tapes • Disks

AMCOM

CORPORATION

5200 W. 73RD ST • MINNEAPOLIS, MN 55435

(612) 835-4731

**CALL TOLL FREE
800-328-7723****We Buy & Sell****DEC**Systems
ComponentsDigital
Computer
Resale**call: 713****445-0082**600 Kennekott Ste C22
Houston, Tx 77060**BUY — SELL — LEASE
IBM Displaywriters****NEW OR USED**Immed. Delivery
We Purchase All Displaywriters**CDB Financial, Inc.**

6220 Jim Miller Road

DALLAS, TEXAS 75228

(214) 324-3491

MODEMS

And Data Communications Equipment

PRICE EXAMPLE

Paradyne LS9600 \$395

AMCOM B1810X \$995

LARGE INVENTORY FULL WARRANTY

Computers & Business, Inc.

705 D. Louis Avenue

Holiday, FL 33590

Please call

813-841-9665

813-938-7025

Telex # 6502303233

FOR SALE**PDP 11/70 System,
New (1980)**

- (1) CPU w/2.048 Kb memory
- (1) RM03-AA 67 Mb disk drive
- (1) LA120 console printer
- (1) FP11C floating point processor
- (2) DH11AD 16 line Async mux E.I.A.
- (1) BA11KE cabinet w/H7420 batt. back-up

PLUS D.E.C. software incl. RSTS/E-V
7.1 operating system, RMS-11, Basic
+ 2-V 1.6, D.E.C. Cobol-V 4.4

..... ABOVE PRICED AT \$49,950

PLUS

- (3) CDC 9766 300Mb disk drives \$6,950 ea.
- Serials 5795, 14825, 36322
- (1) D.E.C. RM05 handler \$750
- (1) SC70-B3 Emulex 4-disk controller \$3,950
- (1) Cincom "Total" data base mgmt. license only \$6,550
- (1) DPD Saver V 2.7 back up utility, license only \$850
- (5) 300 Mb disk packs \$375 ea.
- (2) 80 Mb disk packs \$200 ea.

**CURRENTLY OPERATING
(UNDER MAINT. CONTRACT)
SHEPHERD DATA SYSTEMS
(213) 723-7777
A.C. Bustamante****DATA GENERAL
SPECIALISTS****FOR
Surplus New & Used
Equipment & Systems
with full depot repair facilities.****CALL US
WE TAKE THE TIME.
WE CARE.****JM Associates
Pleasant Valley Ave.
Moorestown, NJ 08057
609-235-5111****Just A
Reminder!**

Starting with the December 31/January 7th issue of Computerworld our 1985 price increase becomes effective. Our open line rate is now \$10.35 and our column inch rate is now \$144.90. The Bulletin Board price per inch is \$140.00.

We would also like to remind you of the early closing for our Combo issue of December 31/January 7th. Classified Closing is December 20th. Please be sure to contact our offices with your space to be in the first issue of 1985. Let us help you start 1985 off on the right foot!

**COMPUTERWORLD**

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

617-879-0700

1-800-343-6474

BUY SELL SWAP		BUY SELL SWAP		BUY SELL SWAP		BUY SELL SWAP		BUY SELL SWAP	
ECONOCOM									
IBM 5110 5120 3741 3742 DATAMASTER 1255 MICR SYSTEMS 34 36 38 32 23 All Associated Peripherals BUY SELL LEASE • Printers • Display Stations • Upgrades • Features • Add-ons • Trades Taken IBM Maintenance Guaranteed Call Today for Quotation (615) 352-6565 SOUTHERN DATA SYSTEMS Nashville, Tennessee		SERIES/1 BUY • SELL • LEASE NEW OR USED • 4955-F—IMMED. AVAILABILITY • 4956-800—NEW SEVERAL AVAILABLE TO SHIP 12/15/84 SPECIAL • 3178—24 AND 36 MO. RATES • 3278/2—ALL KEYBOARDS		5225-004 \$13,000 • 5251/12 (SINGLE CLUSTER) \$3650 • 5251/12 (DUAL CLUSTER) \$4850 • 5225/1 PRINTER \$8500 DISPLAYWRITER SPECIAL • 6580-A08 85% OF LIST 6360-022 6218-A01 • 6580-A04 75% OF LIST 6360-011		INVENTORY SALE • 3420-5 • 3411-003 • 8809-A 1,2,3 • 3370-A 12 • 3276-2 • 3370-B 12 • 3411-003 • 3350-A 2 • 3203-5 • 3350-B2F • 3340-A, B • 3864-002 • 3651-B75 • 5251-011 • 5340-E35/F35 • 5381-581		SYSTEM/36 • EXCLUSIVE VAR AGENT • SPECIAL 36 MO. RATES • ANY SYSTEM WITHIN 60 DAYS • "BOSS" APPLICATION SOFTWARE CALL NOW FOR EARLY INSTALLATION WANT TO BUY • 3803-2 • 3420's • 3830-2 • 3081-K • 3380's • 3083-J • 3880's • 4341 • 5291-1 • 5224-2 • 3375's • 5340-F	
ECONOCOM ...IN MANY INSTANCES, "RIGHT IN YOUR OWN BACK YARD" ECONOMIC COMPUTER SALES, INC. CORPORATE OFFICES 845 CROSSOVER LANE P.O. BOX 240237 MEMPHIS, TENNESSEE 38124 901-787-8130 OR 800-238-3098 • LOS ANGELES, CALIFORNIA 714-883-9831 • ATLANTA, GEORGIA 404-882-1334 • LOUISVILLE, KENTUCKY 502-588-1376 • DALLAS, TEXAS 214-226-6262 • BIRMINGHAM, ALABAMA 205-623-8588 • LITTLE ROCK, ARKANSAS 501-226-6242 • BOSTON, MASSACHUSETTS 617-264-6641 • SOULDER, COLORADO 303-448-1968 • MIAMI, FLORIDA 305-755-4948 ECONOCOM ADHERES TO THE HIGH STANDARDS OF ETHICAL CONDUCT REQUIRED FOR MEMBERSHIP IN: CMAA AEL BSA CW-C									

ECONOCOM is a service mark of Economic Computer Sales, Inc.

CLIP AND MAIL

MARION

BUY • SELL • MAINTAIN

IBM SYSTEM/34/36

- PROMPT DELIVERY
- ALL SYSTEMS 34 ARE FULLY RECONDITIONED
- ALL SYSTEMS 34/36 CONFIGURED TO YOUR NEEDS
- PERIPHERALS — NEW AND USED
- UPGRADES AND FEATURES DELIVERED AND INSTALLED
- LONG TERM LEASES AT COMPETITIVE PRICES
- SHORT TERM RENTALS
- TRADE-INS ACCEPTED
- GUARANTEED WMC OR IBM MAINTENANCE



DISPLAY STATIONS



SYSTEM 36

A PHONE CALL CAN SOLVE ALL YOUR EQUIPMENT PROBLEMS

NEW JERSEY (201) 343-4554
 TALK TO US ... CONNECTICUT (203) 758-2409
 PITTSBURGH (412) 864-6612



WILLIAM MARION CO., INC.
 84 KENNEDY STREET, HACKENSACK, N.J. 07601

4341-M2 3279-92 3287-2 3880-1 3705-M82 Available 2-1-85 Sale or Lease	4341's Lease Terms 1-5 Yrs. 4381's Sale/Lease	Printers 3203 3211 1403 3800 4248 4245 3282 3289 3287 Immediate Delivery
Controllers 3880 3274 3803 3276 Display Stations 3278 3178 3279 3277	DASD 3380 3375 3370 3350 3344 3310 Immediate Delivery	TAPE DRIVES 3420 3430 3410 8809 Immediate Delivery

We Buy, Sell & Lease IBM Processors and Peripheral Equipment



Computer Marketing Inc.
 P.O. BOX O
 MARGATE, NJ 08402-2223
 609/823-6000 • 800/345-0005
 Contact/Bernie Gest

Established 1969



1000
 SERIES E, F, M
 12749 H-H Part Mem
 3000
 SERIES II, III,
 33, 64

 793B 120 MB DISK DRIVE
 7970E 1600 BPI
 TAPE DRIVE
 2831B 180 CPS PRINTER
 2822A TERMINAL &
 MUCH MORE
 2801A PRINTER
 2840A LASER PRINTER
 7976A TAPE DRIVE

TELEX 756927
encore
 (213) 452-9117

DSI

**WE BUY
 SELL &
 LEASE!**

BURROUGHS

Discover the
DSI alternative.

800-641-5215

All equipment available
 immediately and guaranteed
 for Burroughs Maintenance.

DSI Serving the Burroughs
 Community Worldwide
 1440 So. Lipan, Denver, CO
 80223 (303) 777-8211
 Telex 756-102

When You Think Of Leasing Anything, Think Of Comdisco

For Sale Or Lease

3083/3081	3178/3180/3278
4331/4341	3800-1/-3
3380/3880	Inquire About Our Lower Than VPA Lease Rates Without Quantity Commitments
3370/3375	Fill In Short Strings on Short Terms
3420-4/-6/-8	If You Cannot Wait For 3480 - Do A Short Term 3420 Lease
3803-2	Quick Delivery
3725	Quick Delivery
4245/4248	Quick Delivery

Wanted To Buy

3083/3081	3350/3830
3287	3803-2

COMDISCO

Eastern Region		South Central Region	
Connecticut*	203 655-1211	Dallas*	214 641-3255
Carlsbad, NJ	201 896-9500	Houston, TX	713 445-1815
Washington, DC	301 441-1000	Atlanta, GA	404 256-5956
Philadelphia, PA	215 545-8035	Florida	305 423-3177
Boston, MA	617 542-4005	Charlotte, NC	704 335-0804
Red Bank, NJ	201 842-5111	Western Region	
Midwestern Region		San Francisco*	415 943-1111
Chicago**	312 698-3000	Los Angeles	213 436-7757
Michigan	313 644-1500	*Regional Headquarters	
		**Corporate Headquarters	

computer systems/graphics, inc.

IBM - BLUEPLATE SPECIALS

3278 3178 3274 3705-M82
 ANY KEYBOARD ALL MODELS AND OTHERS
 ANY TERM - ANY RATE (almost)

WAYNE 9825 Widmer
 Lenexa, KS 66215
 Telephone: (913) 492-1442



BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

FRONTIER

COMPUTER CORPORATION

Your Full Service
Computer Dealer



4331/4341 303X/370's

3203	3380	3803
3262	3375	3420
3211	3370	3430
2501	3350	3411
3505	3310	3410

Call Ext. 101

SYSTEM 34/36/38

5251	5211	1255
5291	3262	Modems
Memorex Decision Data		

Features Sold Separately

Call Ext. 102

SERIES/1

Over 2,000 Systems Sold Since 1979

Systems Configured To Your Space

Features and Peripherals

Sold Separately

Attractive Lease Plans

Depot Repair Service

and Maintenance

Call Ext. 103

OUTSIDE TEXAS TOLL FREE 800 - 527-6438

HDQTRS: 214 - 330-7243

4573 South Westmoreland

DALLAS, TX 75237

BRANCH: 713 - 550-7358

16151 Calmway, Suite 103

HOUSTON, TX 77084



FORSYTHE McARTHUR ASSOCIATES, INC.

IBM 3705 Model E's

All Memory Sizes, Channel Adapters, & Line Sets

Immediate Delivery

LEASE OR SALE

Memorex 1270/81

Available Now

IBM 3803-2's

Available Now

Hdqtrs: Skokie, IL (312) 675-8000
Atlanta (404) 953-9457 Milwaukee (414) 785-9544
Detroit (313) 332-1272

OVERSTOCKED NORTHERN TELECOM

Displayphones (Part #A0290763)

only \$845 each

Desk Top Printer (Part #A0291073)

only \$521 each

Below Wholesale

• Integrated Data Terminal and

Telephone

• 120 CPS Printer

• All New - In Original Boxes

Call or write NMF/SunData,

4822 Albemarle Road, Charlotte,

North Carolina 28205, 704/568-1323.

FOR SALE NCR HARDWARE

1 6530 81 MB Disk Unit

1 6440 Dot Matrix Printer

with RS232 Interface

2 Adapter Boards for 621

Multiplexer

10 CRT's

20 6530 Disk Packs

Total Price \$9,500.00

1 NCR 399 \$900.00

Call (301) 749-1799

RENT • BUY • UPGRADE • SELL

PDP, 11/03, 11/04, 11/23, 11/24, 11/34,

11/44, 11/70, VAX/730, VAX/750, VAX/780

SYSTEMS • OPTIONS • SUPPLIES

VAX 780 2MB, RUA81, TE16, DMF32, VMS, Short/Long-term Rental

VAX 750 1MB, RUAB0-CA, TUB0-AA, DMF32, LA130, VMS (NEW) \$78,850

11/70 512KB MOD, RWPOB, TWE16, DZ11-E (USED) \$51,850

11/23 256KB, Dual RL02's, DZV11-C, VT102, License (NEW) \$13,950

11/44 1MB, RLPOB, TJE16, DZ11-A (USED) \$41,450

11/24 1MB, H9542, RUAB0-AA, TUB0, DZ11-A (NEW) \$40,750

Customized Configurations—Call With Your Request.

In Stock

11/24-BC

11/04-DC

11/34-DE

11/44-DA

BA11-KU

DW750

DZ11-F

H9642

LA12-AB

LA120-RA

Specials

11/70 (USED).....\$19,850

DZ11-OP (NEW).....\$ 1,885

LA120-DA (UNUSED).....\$ 1,885

RUAB0-AA (NEW).....\$13,950

RP06-AA (USED).....\$ 5,850

RP07-AA (UNUSED).....\$19,500

RUAB0-AA (NEW).....\$16,150

TUB0-AA (UNUSED).....\$ 9,850

In Stock

LP11-EA

LP11-VA

MS11-PB

RK611-EA

RM03-AA

RM05-AA

RP06-AA

TS11-CA

TWE16-AA

VT220-AA

CALL FOR OUR FREE CATALOG.

DEC is the registered trademark for Digital Equipment Corp.



BROOKVALE ASSOCIATES

285 Deer Avenue, Haddonfield, NJ 08033

4020 148th Ave. NE, Suite F, Redmond, WA 98052

800-645-1167 NEW YORK (516) 273-7777

WEST COAST (706) 891-2529

IBM

SERIES/1

SYSTEM	SYSTEM	SYSTEM
34	36	38

4300 • 5110-5120 • S/32

BUY • SELL • LEASE
All models, systems
& peripherals
AVAILABLE NOW!

Ask about our
72 hour upgrades.

(408) 425-7333

1114 Water St., Santa Cruz, CA 95062

SOURCE
DATA PRODUCTS, INC.

Bob Losky
President
& Founder



C.D. SMITH & ASSOCIATES, INC.

DEC computer systems & options

12605 East Freeway, Suite 318

Houston, Texas 77015

(713) 451-3112

TELEX 76-2547

DEC

WE ARE SELLING:

VAX 11/730, 11/750, 11/780

& MOST VAX OPTIONS

ALSO:

730, 750, 780 CPU's

780 w/785 Upgrade Option

725 Systems

RA80, RA81, RA60, TUB0

FP730, FP750, FP780-AA

MS730, MS750, MS780 Memories

H7112-A, H7100-A, DW780-AA

H9652-HA, H9652-MF, H9642-FA

RLV22-AK, RL02-AK, DZ11-E, TM78-C

Call, if you want on our Mailing List

(713) 451-3112

***** DEC *****

BUY—SELL—LEASE—TRADE—CONSIGN

SYSTEMS — PROCESSORS — OPTIONS

PERIPHERAL — MODULES — MEMORY

— SPARES —

NATIONAL COMPUTER EXCHANGE

(800) 624-9299

600 North Lunar Avenue, Brea, CA 92621

(714) 990-5988

Wrightline \$4653 Safe.
Combination Lock,
Fire proof. 72 x 54 x 37
inches external mea-
surements. 13 compo-
nents available, tape
seal door pockets,
Data module roll-out.
Call Controller 609-
683-1933.

COMPUTERWORLD

COMPUTERWORLD's paid circulation climbed to over 126,000 this fall. Folio 400 (Folio Magazine's study of trade publication performance) placed us first in total revenue. As the industry grows, so will COMPUTERWORLD. It will continue to offer the high quality news coverage and editorial content that has attracted its readers. What does that mean to you, our advertisers? Good news...in the form of wide exposure.

The Classified section of the newspaper is laid out in an attractive format and is easy to read. It offers classifications to solve a variety of problems: Position Announcements, Positions Wanted, Buy • Sell • Swap, Software For Sale, Software Wanted, Time & Services, Real Estate, Publications, Bids & Proposals, Auctions, Seminars & Conferences and The Bulletin Board.

Our BULLETIN BOARD section is ideal for the smaller companies who want a low-cost way to sell pieces of equipment (hardware or software). The BULLETIN BOARD is laid out as a quick reference for potential buyers who know what they are after.

So, as a nationwide publication, we give you the exposure you want. As a weekly publication, we give you the immediacy your advertisements need.

A number of special issues of COMPUTERWORLD are scheduled to run in 1985. Each of these issues will feature one aspect of the computer industry and give our advertisers a chance to reach a more select audience. These are the topics the issues will cover:

- December 31, 1984 & January 7, 1985 Combo Issue - '85 Forecast (There will be an early close for this issue on Thursday, December 20th)
- January 28 - Applications Software Pkgs.
- February 25 - Communication Networks
- March 25 - Graphic Systems
- April 29 - Micros in Big Business
- May 27 - Manufacturing Systems
- June 24 - DBMS
- July 8 - NCC Preview
- July 15 - NCC Show (early close July 3rd)
- July 22 - NCC Wrap-Up
- August 26 - Software Productivity Packages
- September 30 - Minis & Small Business Systems
- October 28 - Data Communications Terminals
- November 25 - Protecting The Corporate Information Resource
- December 30, 1985 & January 6, 1986 - Forecast '86

COMPUTERWORLD publishes every Monday with an ad deadline of 10 days prior to each issue date. (Notice early closing for combo issue.) You may send in copy to be pubeset or camera-ready material (velox or negative) via the mail. We provide telecopy service and will also take ads over the phone.

Information concerning classified advertising rates, color costs, ad sizes, mechanical specifications along with more detailed information on the special issues is contained in the 1985 Rate Card #20 and Media Kit.

Our mailing address is

COMPUTERWORLD

Classified Advertising, 375 Cochituate Road,
Box 880, Framingham, MA 01701.

Or call for more information at 1-800-343-6474
or, in Massachusetts, (617) 879-0700

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

Available Immediately

3083 E 16
SERIAL #21770

Any Term Lease

3803 - 02

Tape Controller

3420 - 06

3420 - 08

Tape Drives

(818) 986-2411

EL CAMINO

RESOURCES LTD.

4827 N. Sepulveda Blvd.
Sherman Oaks, CA 91403

LEASE • PURCHASE • SELL IBM SYSTEMS

■ Purchase-Lease Back

■ Upgrade Flexibility

■ Customized Leasing

■ All models & peripherals

CALL US TODAY

612/936-0226

WINTHROP
RESOURCES CORPORATION

Computer Sales and Leasing Division

510 OPUS CENTER • 9900 BREN ROAD EAST • MINNETONKA, MN 55343

Buy - Sell - Lease

S/34
S/36
S/38

IBM

3741
3742

UPGRADES

CPU'S CRT'S PRINTERS

ALL MODELS

PURCHASE/LEASEBACK

SHORT & LONG TERM LEASES

Computer Marketing

of America, Inc.

P.O. Box 71

610 Bryan Street

Old Hickory, Tennessee 37138



1-800-251-2670

In Tennessee: 615-847-4031

THE SOURCE FOR

Series/1

ECONOCOM

• BUY • SELL
• LEASE
NEW OR USED

ECONOMIC COMPUTER SALES, INC.

845 CROSSOVER LANE

P.O. BOX 240297

MEMPHIS, TENNESSEE 38124

(901) 767-9130 or

(800) 238-3098

CDIA AEL

IBM

SERIES I

PROCESSORS/
PERIPHERALS

4300

34

36

38

Phone

1-800-328-7938

(612) 941-9495

TWX 910-576-2916

CDIA

data 3
computer corporation

11000 PRAIRIE LAKES DR. • EDEN PRAIRIE, MN • 55344

***** AVAILABLE EQUIPMENT *****

QTY	MACHINE	AVAILABLE	SALE/LEASE
1	3350	NOVEMBER	SALE OR LEASE
1	3350	NOVEMBER	LEASE ONLY
5	3350	NOVEMBER	3 LEASE ONLY
1	3350	NOVEMBER	2 SALE OR LEASE
1	3340	NOVEMBER	SALE OR LEASE
1	3340	NOVEMBER	SALE OR LEASE
1	3138 WITH 3046	JANUARY	SALE OR LEASE
1	3148 WITH 3047	MARCH	SALE OR LEASE
1	3052 WITH 3056	JANUARY	SALE OR LEASE
1	3033 WITH 3036, 3037	DECEMBER	SALE OR LEASE
1	3032 WITH 3027, 3036	DECEMBER	SALE OR LEASE
1	3031 WITH 3017, 3036	DECEMBER	SALE OR LEASE

CONTACT GORDON MURTAUGH 617-723-3500 EXT. 279

CHANCELLOR CORP.

Inflation Fighters

Quality & Savings

Slightly used, Money Back Guarantee. Full Reels. All External Labels Removed. Guaranteed for use at 600 BPI through 6250 BPI.

2400' Reel \$4.95 ea.

1200' Reel \$4.25 ea.

600' Reel \$3.50 ea.

All Tapes with Hanging Seals

We pay freight on orders over 200 tapes.

All orders shipped within 48 hours.

Call or Write

Computer Tape Mart

44A Seabro Avenue

N. Amityville, New York 11701

[516] 842-8512

BUY SELL TRADE

DEC
SYSTEMS
PERIPHERALS
COMPONENTS

• LSI
• PDP
• VAX

DCE DIGITAL
COMPUTER
EXCHANGE INC.
2775 Industrial Blvd., Hayward, CA 94545
CALL (415) 887-3100

AVAILABLE IMMEDIATELY SALE OR LEASE IBM 3350 A2s/8150 IBM 3350 B2s

Integrated Lease Plans, Inc.

733 Third Ave., New York, NY 10017

Call Donald Lassoff (212) 949-7815

FOR LEASE

10,000 SQ. FT. OF COMPUTER-READY SPACE
Beneficial Plaza - Los Angeles, CA

The most unique office building in Mid-Wilshire area

Includes rental of Contempo Air Conditioning Units, Power Conditioners, Dadco Monitor Security, Tate Floor System, Halon-1301 Fire Protection. Beneficial Plaza offers 24-hr. security, conference rooms, cafeteria and parking.

Call Gary Victorson (213) 381-8295

REAL ESTATE

Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease

MODEMS

DEC

The Bulletin Board

Buy • Sell • Lease

Buy • Sell • Lease

Buy • Sell • Lease

Buy • Sell • Lease

HEWLETT PACKARD

Buy-Sell-Lease
HP3000 3X, III, 4X
and related peripherals
Call Carol
CSU INDUSTRIES, Inc.
516-239-4310

HP 3000

BUY • SELL • RENT • LEASE
Complete Systems
Processors • Peripherals • Parts
ConAm Corporation
Santa Monica, California
(213) 458-2643 (800) 643-4954
Telex: 215 604 PCS UR

HP 1000 **HP 3000**
7925M/S Discs
Available for Sale, short and
long term rental, and lease at
very attractive prices.
Call the HP Specialists Today!!
Computer Solutions, Inc.
(201) 872-8000

HP - 2645A's

Refurbished
\$695.00
While They Last
Most Have 8 K Memory
& Display Enhancements
Windemere Systems Corp.
1-800-638-8795

DEC

SPECIALS

LA-120DA\$1795
LA-100BA1395
LA-12DB995
LA-12AB1395
LA-34595
VT-220A, B995
VT-125AA1795

All Equipment is New &
Available in Quantity

Northeast Services
800-448-0009
617-273-0670

DEC

For Sale:

PDP 11/34, PDP 11/45, 1
RK05 Disk Drive, 3 Ampex
DM980 (80MB) Disk
Drives, 2 DEC TU10 Tape
Drives, 2 Cache Memories,
12 Standard Memories
(32K word memory each),
and DIVA Comp V Disk
Controller. Has run under
RSX-11M operating sys-
tem. For further information
contact Bob Dreyfuss at
301-486-3000.

FALL SPECIALS

CDC 9762, Refub\$2,499
CDC 9766, Refub4,500
LA 36, Unused399
L0006, Used3,000
LP14-CA, New6,900
RA80-AA, Unused9,300
RM05-AC, Used12,000
RP07 (50 HZ-60 HZ), 17,000
TS11-CA, Unused2,999
TU78 Master, Unused 27,500
VAX 780XA-AE, New 121,500

DEC cables/Prime computers available

SEVCO INC.
(617) 435-6938
(617) 435-5331

D.E.C. SPECIALS

VAX 11/780 8 MB \$250,000
1170 Core 1/2 MB \$35,000
(3) RP04's, (1) TUW18, (1) DH11-AD
RP08 Spare Parts Call
Printer Consulting Services Inc.
P.O. Box 265
Plantville, CT 06479
(203) 621-8356

DEC

DEC BARGAINS

11/34A CPU Set	\$1,275
11/44 KE44-A 'CIS'	\$2,775
11/44 CPU Set KD11Z	\$4,800
BDV11-AA	\$350
DL11-W	\$2,400
DR780-AA	\$3,400
PPF11	\$1,175
PP11A	\$1,075
KK11-A	\$1,475
MS11-CE	\$1,750
MS11-LD	\$775
MS11-MB	\$850
MS11-PB	\$2,940
MS780-DD	\$3,500
MSV11-LF	\$700
MSV11-PL	\$1,275
VAX 1MB MS730-CA	\$1,875
VAX 1MB MS750-CA	\$1,875
VAX 1MB MS780-FD	\$2,175

Call Ray at QEL, Inc. (617) 275-8800

VAX 780

Immediate Availability
Short Or Long Term Leases
Brookvale Associates
800 845-1167
New York (516) 273-7777

"Buy/Sell/Lease/Maintain"

New & Used
DEC Equipment
Southwest Automation
Houston, Texas
713/956-8210 Inside Texas
800/231-9789 Outside Texas

DEC NEW & USED

BUY • SELL • EXCHANGE
Systems • Processors • Memory
Options • Peripherals • Modules
LAKEWOOD COMPUTER CORP.
P.O. Box 23279
San Jose, CA 95153
(408) 266-2545

Sale/Lease

11/750 w/3 Megabytes
(1) RH/MBA (1) RGM05-BA
(1) RM05-AC (1) RM05-BC
Call Jeff Sturm at
(415) 283-2915

BUY • SELL • TRADE

1173	KMC11-B	RM03-AA
11725	LA120-DA	RM05-AC
BA11-KE	LA180-AA	RM05-C
BA11-KU	LP11-CA	RX211-BK
BC26V-50	RA60-CA	TS11-BA
FP11-F	RA81-AA	VT220

NEW YORK COMPUTER EXCHANGE
(516) 752-8666 (800) 645-9109

FOR SALE

DEC-SURPLUS
Two 11/45CU's
Two 11/70DA's
Associated Peripherals
87 CRT's
CITY OF MIAMI, FLORIDA
(305) 579-2380
A.L. MULLINS
Purchasing Agent

WANG

ERST is The Leading Dealer

in WANG Equipment:
2200 • VS • WP • PC
CPUs, Terminals, IOP's,
Controllers, Printers,
Memory Upgrades,
Plug Compatibles.
Rental and Leasing Prices
Quoted On Request.
Call Toll Free:
1-800-FOR ERST
In New York: (212) 431-1100
ERST International
Corporation
225 Lafayette Street
New York, NY 10012

WANG VS SOFTWARE SPECIAL

Limited Time Offer
MCBA • CURRENT RELEASE #3
\$1,500 Per Package
A.R. A.P. & G.I.
CONTRACT PROGRAMMING
AND CONSULTING SERVICES
CLIFF DATA SYSTEMS, INC.
(201) 488-2228 (212) 219-5107

WANG

BUY • SELL
MVP/LVP • OIS • VS • PC
SYSTEMS IN INVENTORY
OIS-50 • 5536-4
GENESIS
EQUIPMENT MARKETING
GEM
(602) 277-8230

WAREHOUSE SALE

6581W W/Sheet or Envelope
Feeder \$2500; LVP-32X \$4500;
6581WC \$2250; 5548Z \$5000;
5570 \$4000; Many Other Items.
Visa • MC • Rentals
I.C.A. (404) 877-4388 or
1-800-241-3158

MISC.

Buy • Sell • Lease
• Short Term Rentals •
IBM & DATAPoint
AVAIL IMMEDIATELY
Cougar Computer Corp.
(216) 261-3500
Member CDLA

For Sale By Owner

1 DG S/120 Eclipse
2 CDC 80MB Disk Drives
1 DEC LA120 Console Printer
12 Hazeltine Esprit II CRTs
Call Styman Distributors
(203) 727-0356

PRINTERS

Buy • Sell • Trade
Data Products
Pinttronix
New • Used
CompuCo Inc.
(919) 782-7950

Buy • Sell • Lease
4750 Systems
120 MB Disk
56 K Memory
General Data Processing, Inc.
(713) 523-6454

Call

(800) 343-6474
Or
(617) 879-0700
To Place
Your Ad
Today

DATA GENERAL

NPA SYSTEMS, INC.
SPECIALS: MV6000's - 1 MB
Mos Memory (new)
S280's - 1 MB (new)
S140's - 1 MB
CRTS: D-210, D-211, D-410
CALL FOR INFORMATION:
516-467-2500

DG/ONE PORTABLE

Desktop Generation • CRT's
Immediate Delivery
Systems, Software, Service
Copley Systems
(617) 769-9430

C-350 1Mb System	\$8,900
6061 192Mb Disk S/S	\$9,500
6061A 192Mb Disk	\$8,500
6122 277Mb Disk S/S	\$14,000
6122A 277Mb Disk	\$12,000
8708 2Mb MV6000 Memory	Call
Int'l. Computing Systems	(612) 941-2941

DATA GENERAL

By End User
Nova 4/X, 256 KB, 16 Slot: 6070 10
MB Fixed, 10 MB Removable Disk;
6099 12.5 MB Winchester Disk;
6031 Single Diskette; 4 Line ULM-S;
Cabinet; (16) 10 MB Disk Cartridges
All Data General Maintained
Was \$13,500 - Now \$7,500.
(817) 338-6292

BURROUGHS

BUY SELL LEASE BURROUGHS

Equipment Dealers
Since 1977
Over \$4,000,000
In Stock
Computer Provisions
(216) 248-7878
(Member IBDA)

PRIME

LARGE SELECTION OF USED
PRIME COMPUTER SYSTEMS
...SAVINGS TO 50%
Peripherals also available
1st SOLUTIONS, INC.
2001 EAST CAMPBELL AVE.
PHOENIX, ARIZONA 85016
(602) 957-0999
ASK FOR DON OR MATT

P300 USED COMPUTER
PRIMOS, DOS, MIDAS, FORTRAN
No Release \$ - 128K Bytes
30MB Disk - Phoenix Style
16 Removable - 6 Cartridge
12MB Perfec Disk
2 Terminals - 1 CRT
8 AMLC Lines - Multituser
(612) 452-5650

PRIME PERIPHERALS
(3) 300 Meg Disk Drives
(1) 800/1600 Tape w/Controller
(1) Memotec Box
(4) EMC 1 Meg Boards
(2) EB 1/4th Meg Boards
Priced For Quick Sale
Call Marshall & Swift
(213) 250-2222 800-421-8042

IBM

BUY SELL LEASE TRADE

S/34 S/36 S/38
Available Now All System 34
Upgrades And Features
5340-C23, E35, F37
5360A All Models
3262s
5256 Model 3s
5251 Model 11s
5291 Model 1s
5251 Model 12s
Immediate Delivery •
Guaranteed IBM Maintenance
PROCOM
"The Professional
Computer People"
Call Pat
(212) 279-1717

SALE/LEASE

4341-M2
4341-L1
Call Bill Cahill
(914) 238-9631
Computer Merchants Inc.

IBM

SERIES 1

(1) 4955E	(3) 6327
(2) 7850	(1) 3580
(1) 3581	(1) 7840
(2) 2084	(1) 2095
(1) DC2350	(6) DC2352
(1) 4962-4	(1) 4997-1A
(6) 3101-23	
(1) Data Royal	
Printer IPS7000A	

IBM Maintained
Available Immediately
Call Fred Collier
(513) 621-6111

SYSTEM/38 SYSTEM/36

Disk • Memory
• Communications
UPGRADES
3180s & 5262s
December Availability
(713) 627-7117
(212) 279-4467

SALE/LEASE

4331-L2
S/N 11820
3278-2A Console
3 Comm. Lines
3370-A1 DASD
3370-B1 DASD
3803 Model 1 Tape Ctl.
(2) 3420-5 Tapes 1600 BPI
3203-5 Printer 1200 LPM
Will Reconfigure To Suit
Available Now
\$120,000.
Call Bill Hegan
(914) 238-9631
Computer Merchants Inc.

4381-P02

1870
24 Month Lease
4361-L05

Available 12/21
Sell/Lease
We Buy All IBM Products
Phoenix Computer
Group Inc.
(602) 947-2808

PRINT TRAINS

IBM 1416 & 3216
Bought - Sold - Lease
Repaired - Reconditioned
COMPU-ACT COMPANY, INC.
(813) 863-2461

FOR SALE (AR 8/34 Upgrade & Sys.)
64 Meg Upgrade (S/34)
S/34-C23 (64K/27MB) \$3,900.
S/34 Memory (Any Increment)
Magazine or 20 Diskette Rdr. (S/34)
Series 1 (128K) WANTED
5381-581 8/34 & 3310
Stacy Cheaper!
DATAMARC (404) 252-7480
9065 Roswell Rd., Atlanta, GA 30328

For Sale
IBM SYSTEM 34's
Any Model or Configuration
Disk and Memory Upgrades
Available Within 30 Days
5340-C23 \$3,500
Eligible For IBM Maintenance
Call Pat
(313) 852-2250 ext. 5

Buy...Sell...Lease
IBM MICR
3890 - 1419
1255 - 3694
(813) 722-4534

IBM

CABLES

Series/1
System 34/36/38
IBM PC's
Pioneer Cable Company
(316) 685-5811

FOR LEASE

4341-2
8 MB Processor
MS/3278 Console
Available 1/2/85.
Call:
Chuck Gately
LaSafe Computer Corp.
312-332-3220

NEW IBM

5291 Display
5224 Printer
Reduced prices
(512) 828-1239

S/34	Buy • Sell
256 K Memory\$5,000.*
64 Mb Disk\$4,900.*
32K Memory\$600.*
* Installed	
(904) 589-4685	

SALE/LEASE

SERIES 1
4955 F Bargain
We'll Take Your 4955 E In Trade
Call Louis Felder
(914) 238-9631
Computer Merchants Inc.

SYSTEM/36

Any Configuration
Year End Availability
(212) 279-4467
(713) 627-7117

CONTROL DATA

Keystone
1600/6250 BPI Tape Drives
New \$7,700
Fixed Disk Model 9775
675 Mb Disk Drive
Low Hours \$8,000
Int'l Computing Systems Co.
(612) 941-2941

HONEYWELL

LEVEL 6 & DPS 6 EQUIPMENT
NEW & REBUILT
Systems • Peripherals • Memory
CRT's • Applications Software
ANNOUNCING 3 COMPATIBLE
LD/DP6 PRODUCTS
• 1000 And 1500 LPM Band Printers
• 256/256 MB Winchester Disk Drives
• SA7800 CRT (Sync/Asynch)
Emulates
Low Prices • Prompt Delivery
Boudreau Computer
Services Ltd.
100 Bearfoot Rd.
Northboro, MA 01532
(617) 393-8839
TWX 710-347-7574

Level 64/20 368Kb\$15,000
(5)MS1400 100Mb Disk \$4,000 Ea.
MTU210 800/1600 Tape\$8,500
MTU211 800/1600 Tape\$6,500
600 LPM Printer\$4,500
400/200 Card Read/Punch\$2,500
Int'l. Computing Systems
(612) 941-2941

SOFTWARE FOR SALE

Award-Winning

Elegant Software
for IBM
S/36 & S/38
Computers



Featuring:

- ★ Date-Insensitive Processing
- ★ Large Scale Integration
- ★ User-Defined Vocabulary
- ★ Paperless Processing

General Accounting	Payroll/Personnel
Accounts Payable	Book to Tax Accounting
Accounts Receivable	Order Processing
Equipment & Fixed Assets	Inventory Management
Financial Reporting	Sales Analysis
Planning & Budgeting	Oil & Gas
Job Cost Accounting	Spread Sheet Processor

J.D. Edwards & Company

4949 S. Syracuse / Suite 5500
Denver, CO 80237
303/ 773 3732



Dallas — 214/ 458 0636
Houston — 713/ 880 8278
San Francisco — 415/ 571 5755
Newport Beach — 714/ 955 0118
Bakersfield, CA — 805/ 327 1911
Tulsa — 918/ 493 1477

IBM SERIES/1 (\$FSEDIT USERS ONLY)

Make your life easier!
Switch to H&A's EXEDIT.
Much faster & more
productive. EXEDIT is
very easy to use.
Realistically save 1 hour
per day per programmer.
A must for 3101B & 4978/9
terminals. You have to
see a free demo diskette
to believe it.

H&A COMPUTER SYSTEMS
(415) 434-3517

**SERIES/1
SPECIALISTS**

SELL YOUR SOFTWARE

in the Classified
Pages Of
Computerworld

For more information
call: 800-343-6474
or 617-879-0700

AT - LAST! THE ABC'S FOR MANAGING TODAY'S DATA PROCESSING FACILITIES

5 Years of development and testing
have produced this Nationally accept-
ed, concisely indexed 2 Volume Edition.
A complete set of "Standards" and
"Procedures" which provide workable
tools and examples to ensure the maxi-
mum, effective use of personnel, mat-
erial, resources and equipment.

A MUST FOR EVERY DIRECTOR'S/
MANAGER'S REFERENCE LIBRARY.
For more information on ordering write

NEUBAUER AND ASSOC.
7119 East Shea Blvd.
Suite 106-238
Scottsdale, AZ 85254

LOW COST SOFTWARE

For IBM Systems 34/36
"Accounts Receivable/Billing" Payroll"
"Inventory Control" "Accounts Payable"
"General Ledger"
Preliminary Documentation Available
One Time Purchase -
No Additional Expense
\$250 Each
Or All Five Systems For \$1,000

Contact
L. N. Morris & Assoc., Inc.
608 Riverside Drive (919) 228-0023
Burlington, NC 27215 (703) 228-8517
We Transform "Computerese"
into "Computer Ease"

SOFTWARE WANTED

SOFTWARE WANTED

Central Inventory
Planning And
Merchandise System
For 100 Store Retail
Jewelry Chain With
IBM System 38.

Call Bob Ricardson
919-379-9437



TIME & SERVICES

DEC REPAIR

All our
Repair Prices are
up to 25% less than
DECmailers

VAX 780 • VAX 750 • VAX 730



We repair all DEC equipment from LSI to VAX.
10 day turnaround with expedite service available
plus a 90 day warranty. At TDC, service is our
only product.

DEC is a trademark of Digital Equipment Corp.

Researching all your options
will show you that your best source is
COMPUTERWORLD

DATA PRINTER SALES

Model's 6644 - 1200 Series
Spares Discounts 10% to 30%
Per Call: Service, Ribbons
Refurbs, Maint Contracts

Printer Consulting Services
P.O. Box 265
Plantsville, CT 06479
(203) 621-8356

ICOTECH

Innovative Computer Techniques

COMPUTER SERVICES

IBM 3081 DEC-10

-Remote Job Entry -Online Processing
-Batch Processing -Timesharing
-Optical Mark Reading -Laser Printing

COMPUTER OUTPUT MICROFILM

-Diataphic Mini Auto-Cams
-Diataphic Datamaster
-6250 BPI Capability
-Free Testing

Route 202
Raritan, NJ 08869
201-524-0153
Contact: Joyce Bogaenko

VOLUME DATA ENTRY

SDA offers the lowest rates
available for volume data en-
try. Fast, accurate and fully
guaranteed service. Call today
for a quote on your job.

System Design Associates
1980 S. Quebec St. #103
Denver, Colorado 80231
(303) 337-9473

COMPUTER TIME & TIMESHARING

- We broker computer time.
- IBM timesharing our specialty.
- NEVER a charge to the Buyer.
- Our fees paid by the Seller.

Call Don Seiden at

Computer Reserves, Inc.
(201) 688-6100

Tell Us About The

TIME & SERVICES

You Have To Offer
Here In...

COMPUTERWORLD's

Classified Pages.

Send for this **FREE** brochure and find out why the **Enterprise Files** may be your most important marketing tool

The Enterprise Files from International Data Corporation give you the detailed sales information you need to stay ahead in today's competitive computer market.

Now you can locate prospective clients, fine-tune your promotional campaigns, and track competing companies. And you'll do it all quickly, easily, and accurately.

When you subscribe to the Enterprise Files you'll get up-to-date facts on more than 13,000 companies and the 35,000 computer-related products & services they offer. Many leading organizations have already made the Enterprise Files their number one source of information. Here are four reasons why...

1) Comprehensive listings

The Enterprise Files are divided into two general categories, Vendor Files and Product Files.

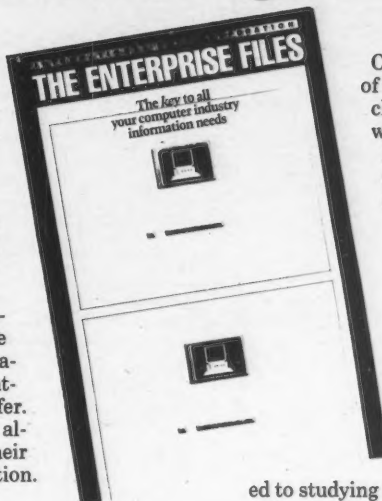
Each vendor profile includes: company and division names, parent company, address and telephone number, type of company, number of employees, years in business, target industries, target applications, key corporate executives, geographic coverage, and product/service offerings.

Every product profile includes: price, model number, date of introduction, the number of installations, channels of distribution, and market status. Also, each product or service is researched individually, with up to 25 product-specific characteristics identified.

You'll get everything you need to compare product specs and contact vendors.

2) Custom packaging

No matter which companies and products interest your organization, you can get the information you need, the way you need it. Because the Enterprise Files are available in three ways. You can choose the complete file, any of 26 standard subfiles, or custom packaging. So you'll pay only for what you need.



3) Easy to use

Once you've determined what kind of information you need, you can choose between three convenient ways of receiving your information.

Magnetic tape for permanent storage, pressure sensitive labels for direct mail promotions, and hard copy for a handy resource tool.

4) Accurate listings

The information in the Enterprise Files is gathered and updated daily by International Data Corporation. IDC has been the leading market research firm covering the information processing industry for 20 years. And IDC is the only firm solely dedicated

to studying this market. So you can rely on the information in the listings.

Send for your **FREE** brochure today

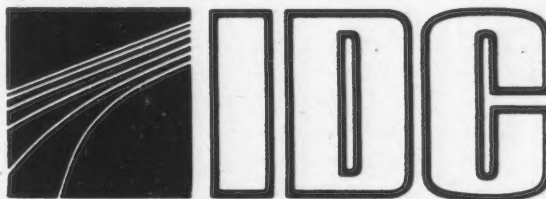
Can you afford to be without this kind of detailed information about your industry? Put the Enterprise Files to work for you. Call Mike Hovagimian today to get your **FREE** copy of our brochure. It describes what the Enterprise Files are, what your custom packaging options are, and includes a rate sheet. Call right now. You can reach Mike at (617) 872-8200.

Or, if you prefer, fill out the coupon below and return it today.

☐ Yes, I want to get all the latest market information. Rush me a **FREE** copy of your brochure today so I can see how the Enterprise Files can help me.

Name _____
Title _____
Company _____
Address _____
City _____
State _____ Zip _____ Phone _____

Return to:
Mike Hovagimian, International Data Corp.,
5 Speen Street, Framingham, MA 01701



INTERNATIONAL DATA CORPORATION

CLASSIFIED ADVERTISING ORDER FORM

Computerworld's
Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Business Opportunities and Real Estate).

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines.

Cost: Our rates are \$128.10 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs \$258.20 per insertion. Extra space is available in half-inch increments and costs \$64.05. Box numbers are \$15.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired: _____ columns wide by _____ inches deep.

Issue Date(s): _____

Section: _____

Signature: _____

Name: _____

Company: _____

Title: _____

Address: _____

Telephone: _____

Send this form to:

COMPUTERWORLD
CLASSIFIED ADVERTISING,

375 Cochituate Road, Box 880,
Framingham, MA 01701

Foreign Editorial/ Sales Offices

Argentina: Ruben Argento, Gen. Mgr., Computerworld Argentina, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: 34-5583/5584. Telex: 22644.

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133, Telex: AA74752 COMWOR.

Brazil: Eric Hippeau, Data News, Computerworld do Brazil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-8225. Telex: 2130838(WOR BR).

Denmark: Preben Engell, Computerworld/Denmark, Gammel Strand 50, 1202 Copenhagen K. Phone: 01-1234-11. Telex: 27566 cwan.

England: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London WC1 8UT. Phone: 01-831-9252, Telex: 262346.

Euan Rose, Bill Dunlop, Stephen Thomas, Beere Hobson Assoc., 345 Goswell Rd., Islington, London EC1V 7HN. Phone: 01278 3415/6 (reps for all CWCI publications except Computer Management and Computer Business Europe).

France: Axel Leblois, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, Paris. Phone: 758.14.14. Telex: 613234 F.

Italy: Daniele Comboni, Gruppo Editoriale Jackson, s.r.l., Via Rosellini 12, 20124 Milano.

Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (03) 551-3882, Telex: 252-4217 (Computerworld Japan only).

H. Kajiyama, Tokyo Representative Group, Sanshin Kogyo Bldg. 3F, 2-10 Kanda Jimbo-cho,

Chiyoda-ku, Tokyo 101. Phone: (03) 230-4117/8, Telex: J26860 (reps for all CWCI publications except Computerworld Japan).

Mexico: Richard Small, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F. Phone: (905) 514-4218, (905) 514-6309. Telex: 1771300 ACHAME, 1777809 ACHAME.

Norway: Mr. Morton Hansen, Gen. Mgr., CW Norge A/S, Hovinveien 43, P.O. Box 2862, Toeyen, Oslo 6. Phone: 2/647725. Telex: (856) 7647725.

Saudi Arabia: Mr. Omar Dusuki, General Manager, Saudi Computerworld, P.O. Box 5455, Jeddah. Phone: 6519690. Telex: (928) 401205.

Southeast Asia: Mr. David Naidu, General Manager, Asia Computerworld, Pte. Ltd., 11-08/11-10 Goldhill Plaza, Newton Road, Singapore. Phone: 250-4444. Telex: (786) RS 37003.

Melvyn Bennett, Regional Sales Mgr., Asia Computerworld Pte. Ltd., 2023 Swire House, 9 Connaught Rd. Central, Hong Kong. Phone: 210395. Telex: (780) 72827 HX COMWR.

Spain: Neil Kelley, Computerworld/España, Barquillo 21, Madrid 4. Phone: 231-23-85; 231-23-86; 231-23-88. Telex: 47894(CW E).

Sweden: Bengt Marmfeldt, Nova Media, Nova Media AB, Vartavagen 55, 11538 Stockholm. Phone: 08-234280. Telex: 8105099 NOVACW.

The Netherlands: Johannes A. Witvoet, Mgr. Dir., Computerworld Benelux, Van Eeghenstraat 84, 1071 GK Amsterdam. Phone: 020-646426. Telex: (844) 18242.

West Germany: Eckhard Utpadel, CW Publikationen, Friedrichstrasse 31, 8000 Munich 40. Phone: (089) 38172-0. Telex: 5215350.

ADVERTISERS INDEX

Algor Interactive	69
Altergo Products	40
American Computer Group	35
Apptech	ID/4
Brask Systems	16
Business Software Inc. (BSI)	16
Cincom	28-29
Cincom	31
Comdisco	23
Comnet '85	ID/14
Computer Associates	10, ID/2
Computer Management Research	11
Computer Technology Group	27
Corodale	32
Cort Data	18
CS Computer Systems	22
CW Enterprise	109
CW Focus	83
CWIMS	88
CW NASA	86-87
CW Subscription	84
CW Sweden	ID/4
D & B Computing Services	75, 77
Data General	42-43, ID/5
DCA/ Microcomputer Division	68-69
Digital Communications Associates	34-35
Digital Equipment	46-47
Digital Micro Systems	22
Dorlen Products	27
Ericsson Information Systems	66-67
Fibronics	10
Four Phase Systems	60-61
Fusion Products	59
Hamilton Sorter Co.	13
Help/38 Systems	72
Hewlett-Packard	36-37, 70-71
Honeywell Information Systems	ID/7-ID/9
Honeywell-Bull	58-59
IBM	25-26, ID/10
IDS	18
Informatics	85
Innovation Data Processing	7
Innovative Electronics	24
Local Data	30

McDonnell Douglas	14
Memorex	ID/12-ID/13
Michaels, Ross & Cole	34
Micro Pro	44-45
Micro Tempe	32
MicroRim	78-79
Micro-Term	76
Mike Murach & Associates	9
MSA	112
National Information Systems	11
Newcorp Products	8
Northern Telecom	48-49
Paradyne	82
ParaResearch	18
Pinzone & Associates	65
Prime Computer	64-65
Protocol Computers	80-81
Realia	12
Robertson, Colman & Stephens	30
Rolm	54-55
RT/ KATEK	ID/15
SAS Institute	20-21
Software Engineering	5
Software Synergy, Inc.	ID/6
SPSS, Inc.	19
Stratus Computer	52
Synsort	3
Sys-ed	16
Teletype Corp.	ID/16
Televideo Systems/ Printers	72
Televideo Terminals	33
Telex	66
Tesseract Corp.	ID/3
Touche Ross	66
Transnet Corp.	16
Unical Corp.	82
Unilic	6
Vision Software	76
Whitesmith Ltd.	24
Wyse	62-63
Xerox Corp.	17, 60
Yates Ventures	ID/6

MSA WE ADD
THE GENIUS
TO COMPUTERS.™

The Software Company.



MEET
THE SYSTEM
THAT MAKES
BORDERLESS
FACT.
NOT FANTASY.

INFORMATION
EXPERT™

Borderless. ■ You've heard the word enough. And until now, that's all it's been. A word. Not reality. ■ But Management Science America has changed that for good. ■ Introducing Information Expert™ (I.E.). The new mainframe software tool that gives you the level of system integration that some companies have been promising. But not delivering. ■ I.E. is truly borderless. ■ It removes the barriers between systems. Between the individual user and accounts receivable. And accounts payable. And general ledger. And more. So that the individual user can retrieve information and design reports from several application programs at once, even if they aren't all MSA programs. Simply and quickly. At one online terminal. ■ And I.E. is designed to meet the needs of a broad cross section of users. It's easy enough for first-time users—because commands are in plain English. And powerful enough for the most advanced DP specialist. ■ And I.E. also gives you higher levels of security than most other systems. ■ Only MSA gives you I.E. ■ It's a giant technological step into the future from the company that has quietly led the way in application software development. It will now be a part of all software MSA provides. The result of 3½ years of intense research and development, it's the tool that has taken the concept of total "system integration" out of the realm of theory and into the realm of fact. ■ To find out more about I.E., contact Robert Carpenter at (404) 239-2000. ■ Management Science America, Inc., 3445 Peachtree Road, N.E., Atlanta, Georgia 30326. ■ I.E. from MSA. ■ It's one more way we're adding the genius to computers. ■ Today and tomorrow. ■

©1984, Management Science America, Inc.

